Working in Natural Gas Instructor Guide



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Elizabeth Aquin, Petroleum Services Association of Canada

Brian Campbell, School District 60

Carla Campbell-Ott, Petroleum HR Council, a Division of ENFORM

Deanna Burgart, P.Eng CET, President, Indigenous Engineering Inclusion Inc.

Steve Dunk, Progress Energy

Larry Espe, BC Ministry of Education

Jordan Eves, ENFORM

Fernie Garbitt, Saulteau (Anishnabe) First Nation

Chris Granberg, Trojan Safety Services Inc.

Allan Greene, Spectra Energy

Lorrie Gowan, Northwest Community College

Evan Saugstad, Consultant for BC Industry (retired)

Pat Hufnagel-Smith, Creative Links Inc.

Art Jarvis, Energy Services BC

Michelle Konkle, Excel Career College

Tamara Nelson, Summit Liability Solutions Inc.

Rick Newlove, ENFORM

Naomi Owens-Beek, TREP Director, Saulteau (Anishnabe) First Nation

Richard Resener, Northern Lights College

Geoff Stevens, BC Natural Gas Workforce Committee

Pauline Stevenson, Excel Career College

Darryl Tegart, Spectra Energy

Jolene Varndell, ENFORM

Ryan Wark, Spectra Energy

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Northern Lights College

11401 – 8th Street, Dawson Creek, BC V1G 4G2

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1.0 Information about the WiNG Program

1.1 Introduction

This document has been prepared as an instructor’s guide for delivering the WiNG program. It contains information to help you in delivering the program.

Created at the direction of the natural gas industry, the purpose of the Working in Natural Gas Entry Level Training Program (WiNG) is to recruit and develop potential workers from around the province and from multiple labour pools, for jobs in the natural gas industry. The WiNG program is designed to help participants understand what the benefits of the natural gas and LNG industries are for them personally and professionally; and it will provide them with the tools to realize the benefits for themselves, if they so choose to proceed with employment in the industry.

We recognize those from Indigenous communities in B.C. and Alberta who generously shared their insight and suggestions on ways to better represent the Indigenous perspective to meet the needs of Indigenous learners and all students who participate in the WiNG program. We are grateful for their knowledge.

1.2 Program Objectives

The key objectives of the program are to:

1. Increase energy literacy – provide information and encourage discussion about what the Natural Gas industry is all about and the contribution it makes to British Columbians and the provincial economy.
2. Stimulate interest in working in the natural gas industry in British Columbia – provide information about natural gas production and working conditions in the industry and assist students to connect with employers and/or transition to education/training programs for higher skill jobs and careers in the industry.

1.3 Target Audience

The BC Natural Gas Workforce Strategy and Action Plan indicates that the industry will need to attract workers from all labour pools in all regions of the province. This includes existing workers, men, and women both employed and unemployed, youth, BIPOC (black, Indigenous and people of color), and new immigrants. Accordingly, the target audience is extremely broad; essentially workers and potential workers interested in exploring employment opportunities in the natural gas and related supplier industries.

The curriculum is written at a level intended to appeal to this broad audience.

1.4 Student Demographics and Cultural Awareness

As an entry-level program delivered to Indigenous students and those who might be new to Canada, there are specific approaches that instructors of this course should be aware of. While the standard perception of a ‘good student’ is one that is punctual, participatory, vocal, and interactive with their classmates, this is not necessarily reflective of the Indigenous, non-white, female, or second language student.

Below are ten important points to keep in mind; this is of course a very cursory list. There are additional resources noted at the end of this section.

1. Introduce yourself at the start of the first class using a land acknowledgement. Do not welcome the students to the area unless you are Indigenous to it yourself. Be sure to share where you are from (do not say Canada, where are your people from? Share some of your history). There are many guidelines on how to do this well. The book “Working Effectively with Indigenous People” by Bob Joseph listed at the end of the section is a great resource.
2. Direct and consistent eye contact is not normative behaviour in many Indigenous and other cultures. Students who do not look you in the eye when they talk to you are not being disrespectful – this is cultural and will require positive coaching from the instructor.
3. When possible, avoid interrupting an Indigenous student when they are talking. They may have a slower speech pattern and will often pause for longer breaks between sentences. If you interrupt them before they are finished, they may not vocally participate again. It is considered rude to interrupt a speaker before they indicate that they have completed their thought.
4. When possible, begin the class with an inviting and social tone. Jumping right into the business of learning will leave your students feeling disrespected.
5. When setting up a large group discussion, you will get better participation from Indigenous or second-language students asking questions of them directly using their name, than posing an open question to the group. In many cultures’ students wait to be invited to speak out of respect for the Instructor’s authority.
6. Indigenous students and those new to Canada may be culturally resistant to vocalising their own strengths or positive qualities as this is often perceived as being boastful. Steps need to be taken to address the differences between ‘selling yourself’ and conceit.
7. Students with one earbud in might appear to be inattentive, but in fact this may be a learned coping behaviour that is helping them focus their attention on the lesson by drowning out other distractions in the room. (of course, this could only be acceptable in a setting where it is not a safety concern).
8. Students who are new to Canada may not know about or understand the complex histories and challenges in the Indigenous communities and may need coaching on proper terminologies and attitudes.
9. Experiential, interactive and hands-on examples will be better retained than over-dependence on the text-based parts of the course. Storytelling and sharing of personal work experience is an important part of developing an engaged learning community.
10. The more that you can present the information orally, rather than having students simply read the text, the better. (For students who have difficulty with long sections of text, there are online tools such as Google translate which they can copy and paste text into, and it will read it aloud to them.).

Following are three examples of resources that can provide more detailed information if desired.

1. Bob Joseph. “[Working Effectively with Indigenous People.](https://www.ictinc.ca/free-ebooks)”  
   This is an eBook with very helpful and accessible guidelines.
2. [“Pulling Together.”](https://bccampus.ca/projects/indigenization/indigenization-guides/) BC Campus Indigenization Guides.
3. [“Indigenous Student Education.”](https://www.univcan.ca/priorities/indigenous-education/) Universities Canada.

2.0 WiNG Program Package

The WiNG program package includes five components each of which are described in this section. Together, they are geared towards providing a   
basic understanding of how the industry works, safety tickets required for employment, and career planning tools that can be used to transition to employment or training in a natural gas occupation directly after completing   
the program.

Program Components

1. Safety Courses
2. Modules
3. Industry Awareness Modules
4. Career Awareness Modules
5. Learning Resources
6. Student Binders
7. Student Assessment

2.1 Safety Courses

The WiNG program includes twelve (12) safety tickets:

1. Common Safety Orientation (Formerly: Petroleum Safety Training).
2. Confined Space Pre-Entry & Rescue Awareness.
3. Detection & Control of Flammable Substances.
4. Fall Protection.
5. Occupational First Aid Level 1.
6. Occupational First Aid Level 1 - Transportation Endorsement.
7. Ground Disturbance.
8. Hydrogen Sulphide (H2S Alive).
9. Oilfield Driver Awareness.
10. Transportation of Dangerous Goods (Learner Verified).
11. Workplace Hazardous Materials Information Systems (WHMIS).
12. Wildlife Awareness.

Instructors are required to arrange for students to take training courses for the above noted tickets. Safety training should be integrated into the overall WiNG program schedule. Individual safety courses should be spread out evenly throughout the teaching of the other program modules (Sections 2 and 3), but ensure that at least two key safety courses be run only once all of the other modules in Sections 2 and 3 have been completed and assignments handed in.

Experience to date in delivering the program indicates that integrating safety courses with the Industry Awareness and Career Awareness modules facilitates student engagement and retention. The safety courses are physical and interactive which provides a break from theory delivery.

It is further recommended that training providers hold off on issuing students any of the safety tickets obtained until the end of the entire WiNG program. This incentivizes students to fully complete the program.

Students must achieve all twelve (12) safety tickets in order to be awarded a WiNG Certificate of Completion.

2.2 Modules

The modules contain the core content of the WiNG program. Content is presented in an easy read manner supplemented by videos and websites for participants to view and visit.

The videos and websites contain most of the information needed to complete the learning activities that are also included in the modules. It is important to give participants sufficient time to view the videos and explore websites. Encourage them to review videos and websites as many times as they feel the need to in class or at home. For videos, encourage participants to take notes immediately after watching the video.

The modules are divided into two sections, set out below.

2.2.1. Industry Awareness Modules

There are ten (10) modules that make up the industry awareness modules.

1. Module 2.0 How to be Successful in this Course.
2. Module 2.1 Introduction to Natural Gas.
3. Module 2.2 The Natural Gas Industry in British Columbia.
4. Module 2.3 Upstream – Well Site Selection, Preparation and Drilling, Completion, Production, Water Recycling, and Reclamation.
5. Module 2.4 Midstream – Processing, Transportation, and Markets.
6. Module 2.5 Downstream – Refining and Markets.
7. Module 2.6 Health and Wellness in the Natural Gas Industry.
8. Module 2.7 Safety.
9. Module 2.8 Terminology and Communication.
10. Module 2.9 Jobs and Careers.

The Industry Awareness modules present information about the industry in a logical sequence and are designed to be delivered in order. In addition, several of the learning activities included in the modules are designed and laid out so that they build on one another.

* The first module sets the stage for participant success in the program.
* The next five modules provide information about the industry beginning with some background and leading into a history of the oil and gas industry, an introduction to the natural gas and LNG industry in BC, and then detailed explanations of the three major sectors in the natural gas industry.
* The next three modules focus on important topics around health and wellness, safety, terminology and communications.
* The final module looks at the types and nature of jobs and careers in the natural gas industry.

2.2.2 Career Awareness and Planning Modules

There are four Career Awareness and Planning modules.

1. Module 3.0 How to be a Valued Employee.
2. Module 3.1 Identifying Interests and Skills.
3. Module 3.2 Looking for Employment in Natural Gas.
4. Module 3.3 Applying for Employment in Natural Gas.

The Career Awareness and Planning modules present information about how to look for work or prepare for a career in the natural gas industry. These modules are also are designed to be taught sequentially as each build on the previous one.

Learning activities in these modules inform and engage students in preparing an employment plan. This employment plan is intended to enable participants to look for work with an employer or to pursue training or education for a skilled job in the industry, once they have completed the program.

2.3 Learning Resources

A package of learning resources has been put together to support delivery of the program. The resources have been donated by the Canadian Association of Petroleum Producers (CAPP) and include:

* Our Petroleum Challenge - Sustainability into the 21st Century, Eighth Edition, Online PDF Version, Canadian Centre for Energy Information.
* Evolution of Canada’s Oil and Gas Industry, A historical companion to Our Petroleum Challenge.

2.4 Student Binders

A WiNG Program Binder has been assembled for each participant. The binder contains:

1. A program map showing all of the sections of the WiNG program.
2. A Table of Contents and Tabs for Safety Tickets – students can place safety training information and course completion documents in the binder behind the appropriate tab.
3. The modules for Section 2 Industry Awareness and Section 3 Career Awareness and Planning, prefaced by a Table of Contents and separated by Tabs.
4. Copies of the CAPP Learning Resources.

As the instructor, you have been provided with a WiNG Program Binder for yourself, as well as one for each student.

Note, in some circumstances, the learning materials and support documents will be provided electronically for download to the students’ laptops.

3.0 Student Assessment

3.1 Principles of Assessment

The following principles provide a foundation for the development of assessment, evaluation, and communication of student learning. These principles are intended to provide instructors with guidance for assessment that aligns with British Columbia’s standards of education.

A Quality Assessment:

* Is fair, transparent, meaningful and responsive to all learners.
* Focuses on all three components of the curriculum model – knowing, doing, understanding.
* Provides ongoing descriptive feedback to students.
* Is ongoing, timely, specific, and embedded in day-to-day instruction.
* Provides varied and multiple opportunities for learners to demonstrate their learning.
* Involves the student in their learning.
* Promotes the development of the student self-assessment and goal setting for next steps in learning.
* Allows for a collection of student work to be gathered over time to provide a full profile of the learner and learning.

Throughout the learning process, instructors and students intentionally gather evidence to inform teaching and learning. The teacher creates rich tasks, engages with the students in setting criteria, establishes exemplars, and leverages the power of questioning to allow for ongoing, timely, descriptive feedback to the student. This process assists students in moving forward toward their learning targets and goals. Students are encouraged to reflect and self-assess to build important meta-cognitive skills. Personalization lends itself to assessment as learning, where students participate in the setting of criteria and the design of inquiries, and self- and peer-assessment.

Instructors document student learning over time using collections of student work and demonstrations to create a profile of his or her strengths, areas of growth, and areas for further development.

3.2 Assessment Tools

Instructors are requested to assess students using the tools listed below. This assists in ensuring standardized, quality program delivery and verification of student achievement of prescribed learning outcomes.

The assessment tools include:

1. Learning Activities.

Each module contains one or more learning activities for students to complete. There is no need to grade the learning activities, the goal is to confirm that they are done.

1. A Personal Employment Plan.

Figure 1 shows all the elements of the Personal Employment Plan that each student should complete and present to the instructor at the end of the program. Students create each element as part of the learning activities in the Career Awareness Modules (3.1 through 3.3).

Ask students to print each element of their plan and present them as part of the final assessment, a mock job interview.

As with the learning activities, the plan does not need to be graded, it needs to be completed.

Review the student's Employment Plan according to the following criteria.

1. Are all the elements present?
2. Are all the elements complete?
3. Is the plan professional? Organized? Easy to read? Appropriate documents printed out?
4. How useful does the participant think each of the elements are?
5. A Mock Job Interview.

The final assessment is a mock job interview session where the instructor acts as a natural gas employer and the student as someone applying for a job. The goal of the interview is two-fold:

1. To confirm student learning about the industry.

2. To build students’ confidence in presenting themselves talking   
to employers.

Conduct the mock job interview with the same rigour and importance you would expect a real job interview to be managed. Both you and the student should approach the session professionally with the goal of mutually agreeing at the end on whether the student has met the program requirements.

Extra attention should be paid in this activity to the respectful development of eye-contact with Indigenous or second-language students for whom this social behaviour is not viewed culturally as a positive characteristic.

Below are some tips for conducting interviews.

* Conduct the interviews 1-on-1 in a confidential setting, where the student will not be overheard or distracted by their classmates.
* Have the student apply for the job posting in their Employment Plan.
* Allow 25-35 minutes for each interview.
* Select a mix of questions (6-8) using information from the student’s resume (in their employment plan) and the common interview questions in Module 3.3 as well as at least one from the list of questions that cannot be asked. Use the same questions for all the interviews.
* The instructor should lead the interview, as an employer would. However, use the opportunity to coach students if they have difficulty with questions, or answer poorly. Sometimes you may need to stop the interview, provide feedback, and then re-start the interview to allow the student to re-answer a question or make a different approach.
* At the end of the interview, provide the student with your feedback; start with something positive, then constructive, and end with another positive.
  + Be honest and direct. This is a safe place for them to receive feedback and practice applying it.
  + Did they arrive on time and prepared?
  + Did they speak clearly and confidently?
  + Did they answer the questions?
  + Did they use examples of their skills and experience when responding to questions?
  + Would you hire them? If yes, why? If no, why not?

|  |
| --- |
| Your Personal Employment Plan |
| Job Analysis Tools |
| ❑ Competency Checklist |
| A checklist that shows how your skills, knowledge, and qualifications match to a specific career or job. |
| ❑ My Career and Job Choices |
| A shortlist of careers or jobs that you are interested in. |
| ❑ Career and Job Summary |
| Information about one career or job you want to pursue. |
| ❑ Job Posting Analyzer |
| A tool to take important information from job postings and create job applications, cover letters and resumes that stand out. |
| Personalized Resources |
| ❑ List of Target Employers |
| A list of target employers you have researched and prioritized as good candidates to work for and likely to have one or more of your target careers or jobs. |
| ❑ List of Contacts/Network |
| Names and contact information for people in your network to contact to help you with your career or job search. |
| ❑ Resume |
| A resume in a format preferred by natural gas employers that you have tailored to the career or job you are looking for. |
| ❑ Cover Letter |
| A cover letter for your target career or job, in a style preferred by employers in the natural gas industry, ready to send to potential employers. |
| ❑ References |
| A list of carefully chosen personal and business or work contacts who are willing to provide you with a reference for prospective employers. |

4.0 Program Completion

This section includes information about:

* The requirements for successful completion of the program.
* Awarding Certificates of Completion to students who successfully complete the program.
* Record of Results forms that instructors are required to complete.
* Instructions for issuing Certificates of Completion.

4.1 Requirements for Program Completion

1. Successfully complete training and obtain a Certificate of Completion (or the relevant documentation proving successful completion) for each of the twelve (12) safety tickets included in the program.
2. Participate actively in classes and learning activities.
3. Complete all elements of the Employment Plan detailed in Career Awareness and Planning outlined in Section 3.
4. Participate in a final assessment, structured as a mock job interview, where the instructor and participant review and evaluate the participant’s learnings and Employment Plan.

4.2 Awarding Certificates of Completion

Students who meet the program completion requirements receive a Certificate of Completion ([see Appendix A](#Appendix_A)). The certificate is endorsed by the natural gas industry and the British Columbia Ministry of Advanced Education.

4.3 Record of Results Forms

A form for recording participant results against the program requirements is provided in the last section of this document. Instructors are required to complete and submit one form for each participant. A copy of the document is shown in Appendix C.

Completed Participant Record of Results forms and Evaluation Surveys, along with the completed Instructor Evaluation Survey are to be submitted to:

Robert McAleney, Director

BC Centre of Training Excellence in Oil and Gas

Northern Lights College

Email: [rmcaleney@nlc.bc.ca](mailto:rmcaleney@nlc.bc.ca)

Direct: 250-787-6250

Cell: 250-261-3719

5.0 Instructional Approach and Support

This section provides information about how the program should be taught.

* Inform and educate (energy literacy), not advocate or persuade individuals to think one way or the other about the industry.
* Emphasis on critical thinking skills, teamwork, peer learning, discussion groups, case studies, role-play, simulations, mind maps.
* Adult learning and how it’s different from K-12 experiences.

5.1 Recommendations

Instructors are encouraged to make the program as practical and “real life” as possible, including engaging industry and employer representatives in helping to deliver the program as much as possible e.g. guest speakers.

The curriculum for the WiNG program was developed based on existing curriculum and resources available in the public domain and from donations by industry representatives. To the extent possible, resources are focused on the natural gas industry in British Columbia, however in some cases, materials from other jurisdictions were used, as either none were found in the province, or those that were available were less effective in illustrating the key learning points. References crediting original source information are included in the modules.

Training delivery should be consistent with the College’s or Training Institution’s standard policies and procedures for training delivery.

The instructional designers for the program are available to answer questions regarding the curriculum and resource materials. Contact information is included at the end of this section.

5.2 Support

For any queries or additional information and support regarding curriculum and learning resources, and training delivery, please contact:

Robert McAleney, Director

BC Centre of Training Excellence in Oil and Gas

Northern Lights College

Email: [rmcaleney@nlc.bc.ca](mailto:rmcaleney@nlc.bc.ca)

Direct: 250-787-6250

Cell: 250-261-3719



6.0 Program Evaluation and Feedback

Participant and instructor feedback are important to ensure the WiNG program meets its objectives and consists of quality, effective curriculum, and learning materials. We thank you in advance for your efforts in this regard*.*

The WiNG program uses two (2) forms to gather information about the efficacy of the program. One solicits feedback from students and the other solicits feedback from the instructor.

6.1 Feedback Surveys

An evaluation survey has been prepared to solicit feedback about the program including the curriculum and learning resources from the students, and from the instructor.

The instructor is requested to have all students complete the ***Student Program Evaluation Survey*** on the last day of the program. The information students provide in this survey is completely anonymous and will be used by the Centre for Training Excellence in Oil and Gas to improve the effectiveness of the Program and its marketing. Instructors should emphasize to students that their feedback should include specific details and that their feedback is a valuable piece of the WiNG learning community.

Similarly, the instructor is requested to complete the ***Instructor Program Evaluation Survey***. Feedback from instructors delivering the WiNG program regarding the program format, content, curriculum and learning resources, and responses from students is requested. We thank you for your candid and constructive feedback.

Please note that you may be contacted by the Centre for Training Excellence in Oil and Gas if they need additional information or have any questions regarding your valued feedback.

Both the instructor and student evaluation surveys will be provided to you prior to the last day of the program. The instructor is required to collect completed forms from students and submit them with the students’ results.

7.0 Lesson Plans

7.1 Introduction

This section of the Instructor Guide includes lesson plans for each of the industry awareness and career awareness modules included in the WiNG program.

The lesson plans presented here are for the ***suggested use*** by instructors. Instructors are encouraged to review lesson plans and modify/ adapt them for use as appropriate. While it is mandatory that instructors cover all the content of the WiNG program, how content is taught is at the discretion of individual instructors.

The lesson plans have been developed by experienced WiNG instructors. They incorporate auditory, visual, and kinesthetic principles of learning.

As is important for any educational program, instructors are encouraged to:

1. Create a safe environment where students feel comfortable expressing themselves.
2. Build relationships with students from the very beginning; this will help facilitate learning and discussion during the class. It is common in every cohort that some students will not have a resume and will need help creating one and that should be arranged ahead of time. When the mock job interview time comes all the pieces should be in their place: a strong relationship with the students, strong exposure to the subject matter, access to support, a positive and constructive atmosphere.

When delivering the Career Awareness and Planning modules, the instructor should emphasize key words like dependable, punctual, trustworthy, hardworking, knowledgeable, honesty, integrity, diversity and inclusion, team player, good listener to prepare the students for the job market. At the same time, instructors should be compassionate, encouraging, not patronizing, not demeaning, have very good attention to detail, speak clearly and slowly (intelligible).

7.2 Lesson Plan Structure

Lesson Plans are designed along the same structure as the WiNG modules provided to the students. Sections in the Lesson Plans are generally uniform throughout, although in some cases additional sections have been added to address a specific learning area (e.g., new vocabulary used in a specific module).

Each lesson plan is laid out as follows:

1. Overview
   1. A high-level description of the focus of the module.
2. Learning Outcomes
   1. The learning outcomes for the module.
3. Required Materials and Resources
   1. A list of materials and resources required to teach the module.
4. Icebreaker and/or Quote of the Day.
5. An optional warm up activity with participants. The intent is to start the daily lesson with an open discussion designed to stimulate thinking and create more open connections between students and with the instructor.
   1. Instructors may use the Ice Breakers provided or find another one they feel better conveys a point, is timelier or connects more directly with the day’s lessons. The idea is to ask lots of questions and encourage critical thinking by the students.
   2. Instructions when using Icebreakers and/or quotes.
      1. Read / Show the quote to the students.
      2. Ask students to write down the thoughts that come to mind when they see/hear the quote.
      3. Ask students to share their thoughts and discuss as a class.
6. Summary of the Sections and Learning Activities in the Module.
   1. Shows the major sections (including a brief description of their focus) and all of the learning activities in the module. Where necessary, instructions for the learning activities have been enhanced to clarify and help students fully participate in and/or complete the learning activities.
7. Suggested Reading.
   1. A list of the suggested readings included in the student modules. These are optional resources for students to obtain more information or learning on their own time. Not every module has suggested readings.
   2. Notes.
   3. A place for the instructor to record observations or suggestions for improvement as they deliver each module. These notes will be helpful when completing the instructor program evaluation survey.

8.0 Index of Lesson Plans

[Lesson Plan: Module 2.0 How to be Successful in this Course](#Module_2)

[Lesson Plan: Module 2.1 Introduction to Natural Gas](#Module_21)

[Lesson Plan: Module 2.2 The Natural Gas Industry in British Columbia](#Module_22)

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[Lesson Plan: Module 3.2 Looking for Employment in Natural Gas](#Module_32)

[Lesson Plan: Module 3.3 Applying for Employment in Natural Gas](#Module_33)

Lesson Plan: Module 2.0 How to be Successful in this Course

1. Overview

This module provides some basic tools that will help students feel more comfortable in the class, and to get ready to learn. The next several sections detail some key strategies that can assist new or returning students be more successful learners.

2. Learning Outcomes

*When you complete this module, you will be able to:*

1. Identify and describe your responsibilities as a learner.
2. Identify and describe the responsibilities of your instructor.
3. Describe how attendance and punctuality aid help you to be a successful learned.
4. Demonstrate strategies for time and class project management.
5. Describe ways that you can actively plan for and participate in your own learning.

3. Required Materials and Resources

1. Projector with audio and projection screen.
2. White board and white board pens / chalk board and chalk.
3. Computers with internet connection; preferably one computer per student.

4. Ice Breaker

Insanity: Doing the same thing over and over and expecting different results.

Albert Einstein

5. Summary of Sections and Learning Activities in the Module

The module has 5 sections each of which presents a strategy to help participants be successful learners in the program. The sections (strategies) and associated learning activities are listed below.

5.1 Get Organized

Tips for students to organize themselves so they can participate in the program and not be overwhelmed.

5.1.1. Learning Activity 1 Get Organized

Instructions

1. Break the class into several small group and have them discuss each strategy to see how it can be used in the program.
2. Ask each group to choose one person to take notes, and then share their ideas with the class.

5.2. Talk to Your Instructors

5.2.1. Your Learning Starts With YOU

This section speaks to the need for students to effectively communicate with the instructor if and when they don’t understand something or feel they are falling behind. It should be emphasized that this communication also needs to be done in a timely fashion – i.e. when a problem first arises – and not days or weeks later.

5.2.2. Tips for communicating with your instructor

A reminder for students that you as their instructor, are there to help them. Convey to them that they should view the instructor as an ally rather than an authority figure. The section then lays out some basic ground rules that will ensure there is effective and respectful communications between the students and the instructor, as well as between the students themselves.

5.2.3 Learning Activity 2 Talking to Your Instructor

You are going to take turns being the instructor and the student.

Instructions

1. Ask the student to find a partner to work with.
2. With their partner, ask them to practice asking questions that they may have about the course.
3. Note, that the partner might not know the answer but can give you feedback on whether your question is clear, whether you have introduced yourself, etc.

5.3. Come to Class Prepared

Introduces the students to a broader, more inclusive interpretation of what being prepared means, and its importance in enhancing a student’s learning experience. Looks at both physical and mental preparation for learning.

5.3.1 Learning Activity 3 Superhero Pose

The following activity can help lower blood pressure, increases oxygen in the body, and helps a person feel relaxed and more confident. It takes only minutes but can make the difference in their day. Even if they are already running late and are stressed – suggest they take the extra two minutes in the hall to do this for themself. They will be more prepared to learn.

Instructions

1. Ask students to stand and find a space in the room where they are not distracted by others; ask them to face the wall.
2. Have them stand with your feet, shoulder width apart, hands on their hips, elbows out wide.
3. Ask them to lift their chin and drop their shoulders.
4. Once in position, instruct them to breathe slowly but deeply for 10 breaths, in through the nose, out through the mouth.

If students are interested in learning more about how power posing can boost your confidence, suggest they check out this [TEDTalk video](https://blog.ted.com/10-examples-of-how-power-posing-can-work-to-boost-your-confidence/) (20 minutes,   
48 seconds).

5.4. Understand Your Learning Style and Develop Your Skills

This section brings attention to the fact that people have quite different learning styles that are often, but not always, related to the culture they were raised in.

Bring to the students’ attention that some cultures adhere to very structured and formal styles of learning where students are not encouraged to speak up or question their teachers. Others learn through storytelling and sharing, while other learn by doing. These can also be intertwined with each other.

The students are then introduced o the three basic types of learning styles: auditory, visual, and tactile. Note that they may lean towards only one style or all three.

5.4.1 Auditory Learners

Provides a more detailed explanation of what an auditory learner is and provides some suggestions of things that auditory learners can do to learn better.

5.4.2. Visual Learners

Provides a more detailed explanation of what a visual learner is and provides some suggestions of things that visual learners can do to learn better.

5.4.3. Tactile Learners

Provides a more detailed explanation of what a tactile learner is and provides some suggestions of things that tactile learners can do to learn better.

5.4.4. Learning Activity 4 Learning Types

This exercise highlights that no one learning type is better than any other – they are just different.

Instructions

1. Break the class into several small groups.
2. Have the students talk with their classmates about what kind of learner they think they might be.
3. Ask them to try to draw a diagram that shows how the different learning styles are present in your class.
4. Once the students have identified their primary learning style (and perhaps a secondary one), organize the students in the room by their primary style, then their secondary style.
5. Have each learning group show the differences and similarities.

5.5. Participate. Be on time. Be present.

5.5.1 Participate respectfully

This section describes different ways for students to participate in discussions. The intent is to raise awareness of the different ways and help students to help themselves and others participate in discussions.

5.6. Conclusion

This section connects the strategies and tips for successful participation in the program to application for success elsewhere, where it is looking for work or working in the natural das industry or any industry.

Highlight that there is no better time to start practicing being on-time, prepared, and present, than in this program.

6. Suggested Reading

* There is no suggested reading for this module.

7. Notes

Lesson Plan: Module 2.1 Introduction to Natural Gas

1. Overview

1.1. Welcome

Module 2.1 introduces the WiNG program, highlighting the broad range of employment and business opportunities, the industry offers British Columbians, and the importance of becoming energy literate in order to participate effectively and benefit from the industry’s growth in the future. The balance of the module describes natural gas and the history of its development as an energy source.

1.2. Energy Employment and Business Opportunities

A brief overview of the broad range of business opportunities and challenging, well-paying jobs and career paths natural gas and LNG energy sectors offer British Columbians.

This is one of the three main objectives of the WiNG Program. Highlights that jobs and careers can be both directly in the natural gas industry, or indirect – through employment working for firms or organizations that services, supplies, or regulates the natural gas industry. In addition, students should understand that there are also plenty of opportunities for entrepreneurs in business and commerce related to the production, transportation, and distribution of natural gas and LNG, and also in providing products and services to the people living in communities where natural gas is extracted, processed and shipped.

1.3. Energy Literacy

This is the second of the three main objectives of the WiNG Program. In addition to helping students better understand how to find work in the industry, the WiNG program will help them become more **Energy Literate**, by increasing their understanding of what natural gas is, how it is produced, and what type of economic contribution the industry makes to the province and the country.

1.4. Industry Community Literacy

This is third of the three main objectives of the WiNG Program. The intent is to enhance students’ appreciation that British Columbia is a diverse province and the natural gas industry works across, and in many regions and communities. The natural gas industry employs people from a wide range of places and backgrounds. It is important to understand how these different people and communities, including those on First Nations territories, in remote and urban locations, operate.

2. Learning Outcomes

*When you complete this module, you will be able to:*

1. Identify early uses of natural gas.
2. Describe important events and figures in the history and development of oil and gas as an energy source in Canada and the United States.
3. Explain how looking at the development and use of energy in the past can help shape future development and use of energy.
4. Describe some of the people and places involved with the natural liquid gas industry today.

3. Required Materials and Resources

1. Projector with audio and projection screen.
2. White board and white board pens / chalk board and chalk.
3. Computers with internet connection; preferably one computer per student.

4. Ice Breaker

“We are like eggs at present. And you cannot indefinitely be just an ordinary decent egg. We must be hatched [and fly] or go bad.”

CS Lewis

5. Summary of Sections and Learning Activities in the Module

5.1. Origins of Oil and Natural Gas

This section provides a brief overview of the early uses of petroleum products in early civilizations and societies around the world, including ancient and accomplished Indigenous civilizations of North, Central and South America.

5.2. The History of Oil and Gas

5.2.1. United States

The next five videos provide an overview of the history of the oil and gas industry. Explain that history of oil development the United States is connected to the industry history in Canada. As well, the history of the production of oil is connected to the history of natural gas.

* Video 1: [History of Oil Part 1](https://m.youtube.com/watch?v=s_52IcYY8bQ) (9 minutes 53 seconds).
* Video 2: [History of Oil Part 2](https://m.youtube.com/watch?v=q9cd29Dxfzw) (9 minutes, 53 minutes).
* Video 3: [History of Oil Part 3](https://m.youtube.com/watch?v=nil52OqvwQs&t=30s) (9 minutes, 55 seconds).
* Video 4: [History of Oil Part 4](https://www.youtube.com/watch?v=Xne3jbYSvs8&t=14s&app=desktop) (9 minutes, 58 sec) Note,   
  watch up to minute 5.
* Video 5: [History of Oil Part 5](https://m.youtube.com/watch?v=-te2nOQZSQU&t=26s) (2 minutes, 51 seconds).

5.2.1.1. Learning Activity 1 Understanding the History of the Oil and Gas Industry

This learning activity involves watching video 1 with students and talking with them about important figures and events.

Instructions

1. Watch Video 1 with the students.
2. Stop a few times and ask students the following questions:
   1. Who is Abraham Gesner?
   2. What is sperm oil?
   3. What is kerosene?
   4. What is brine?
   5. Who is Edward Drake?
      * Answer: An American businessman and the first American to successfully drill for [oil](https://en.wikipedia.org/wiki/Petroleum).

5.2.1.2. Learning Activity 2 See How History Impacts Development of Industry

In this learning activity, students watch the above videos and then answer questions that prompt them to consider how the development of an industry can be shaped by looking at what has happened in the past.

Instructions

1. Watch videos 1 through 5; Watch video 4 up to the 5-minute mark. Note at the 5-minute mark, video 4 delves into the creation and expansion of private oil companies in the US, which while interesting, is not directly relevant to this course. Students wishing to watch the remaining part of this video can do so at the end of the class.
2. Have students answer the questions below.
   1. Why do we study history in general, and why do we study the oil and gas history in particular?
   2. What can we learn about the industry now, from learning about the industry then?
   3. Give an example of what “one door closes another one opens” means in the oil industry.
   4. When was Standard Oil Trust dismantled; what are the spin-off companies?
   5. What can we understand about the oil and gas industry based on the people that are represented in the video? Who were the average people that were working? Where did they live?

*Answer:* Standard Oil was broken up into 34 companies, among them those that became Exxon, Amoco, Mobil and Chevron. Ended a virtual monopoly and created competition between the new firms.

1. Engage students in a class discussion using the discussion questions in the module as a starting point.

5.2.1.3. Learning Activity 3 Mind Map Important Events in Oil and Gas History

This learning activity involves students creating a mind map to highlight important events in the recent history (post 1950) of oil and gas. A mind map graphic and tips for creating mind maps are included in the Student Module and are shown below for reference.

Instructions

1. Explain what a mind map is – a visual presentation of learning, e.g., students’ understanding of oil and gas history.
2. Have students work in small groups or create the mind map as a class.
3. Ask students to identify what they see as the most important events, for example:
   1. Logo for Shell, Phillips 66, TEXACO.
   2. OPEC.
   3. 1973 Embargo.
   4. Iraq War.
   5. Drawing of an important figure.
4. Instruct students to put their events on paper (or the Board) using words or by drawing a symbol or picture.
5. If the class is working in small groups, have a class discussion where each group shares their map.

****Mind Map Example

How to Construct a Mind Map

**Start with a blank piece of paper (larger is better), flip chart or whiteboard**

1. Write the key idea or central theme in centre of the page, flip chart or whiteboard
2. Next, write down 1 to 3 key words for each topic. Place these around the central idea
3. Leave room between key secondary topic words to make it easier to read
4. Use thick lines to connect the central idea to each secondary topic
5. For each secondary topic, write down any subtopics around each secondary topic
6. Use thinner lines to connect the subtopics to the secondary topic
7. Where appropriate, add additional concepts and ideas (details) to the subtopics

**Draw Quickly**

1. This is a brainstorming activity
2. Ideas should be expressed quickly
3. Use words or simple drawings, icons, doodles, images, symbols to express the concepts, ideas, issues, etc. that you are trying to convey

**Look for relationships to show connections between ideas, use:**

1. Groupings
2. Branches
3. Colours

**Use capitals, colours & line thickness to:**

1. Focus attention on key words or important themes.
2. Show main ideas and subtopics.
3. Highlight e.g.
4. Thicker lines closer to the centre.
5. Thinner lines further out, for subtopics, details, etc.

5.2.2. Canada

This section highlights information specific to the history of oil and gas development in Canada, describing the historic strike that opened the Western Canadian oil economy and providing some historical and background information about some of the major oil and gas companies that played significant roles in the exploration, refining, and distribution of oil and gas in Canada. The last video provides some historical and current information on the use liquified natural gas (LNG) and compressed natural gas (CNG) in British Columbia.

* Video 6: [Huge oil reserve struck near Leduc, Alberta](http://www.cbc.ca/player/play/1719759795/)   
  (13 minutes, 29 seconds).
* Video 7: [Leduc: the oil derrick that made Alberta rich](http://www.cbc.ca/player/play/1499406992/)   
  (3 minutes, 41 seconds).
* Video 8: [History of Chevron Canada](http://www.chevron.ca/about-chevron-canada/chevron's-history-in-canada/upstream-operations-75th-anniversary-videos) (2 minutes, 47 seconds).
* Video 9: [Natural gas in BC | FortisBC](https://www.youtube.com/watch?v=zZSGwQTuYuc) (1 minute, 44 seconds).
* Website 1: [Shell Canada: Timeline of Shell Operations in Canada](https://www.shell.ca/en_ca/about-us/who-we-are/canadian-history-timeline.html).

5.2.3. British Columbia

This section provides some of the key milestones in the development of the commercial oil and gas industry within British Columbia.

5.2.3.1. Learning Activity 4 Explore the History of Oil and Gas in Canada and British Columbia

In this learning activity, students learn about the history of oil and gas in British Columbia by watching a series of videos and visiting a website.

Instructions

1. Ask students to watch videos 6, 7, 8 and 9, and review website 1.
2. Engage students in a class discussion using the discussion questions as a starting point.
3. Instruct students to answer the following questions based on the information learned in the videos and from the website.
   1. What is the purpose in reviewing the history of oil for a course on natural gas and liquefied natural gas (LNG)?
   2. What can we learn about the industry now, from learning about the industry then?
   3. Why is that important?

5.3. LNG Industry Community

A brief introduction to the LNG industry, an increasingly important subset of the natural gas industry, noting the potential economic, social, and environmental impacts on the communities, including Indigenous communities, across BC.

5.4. Indigenous Communities and Companies

This section provides some information about some of the different First Nations companies and communities active in the LNG industry.

**Figure 2** in the Student Module highlights the many Indigenous bands across Northern BC, that have agreements to participate in the Coastal Gas Link (LNG) pipeline.

The following videos offer some information about different Indigenous companies and communities in the industry.

* Video 10 [Backwoods Energy Services – Indigenous Owned Oilfield Firm](https://www.youtube.com/watch?v=beX4qF3ocSo) (04 minutes, 06 seconds.
* Videos 11 and 12 [Clifford White, Chief of Gitxaala Nation, which belongs to a collective of First Nations that support sustainable and responsible LNG development in BC.](https://together4lng.com/clifford-white-lng/) (00 minutes, 58 seconds) (00 minutes,   
  48 seconds).
* Video 13 [First Nations LNG Alliance: LNG Helping to Close the Gap](https://vimeo.com/282347465)   
  (05 minutes, 40 seconds).

Other resources to have the students explore can be found by following the link to Website 2 below.

* Website 2: [BC Oil and Gas Commission Indigenous Partnerships and Relationship Opportunities Interactive Infographic](https://www.bcogc.ca/files/images/Partnerships-and-Opps-Infographic-FINAL_-Interactive-PDF_2020.pdf).

The graphic contains clickable links that provide detailed information on:

* Education, training, and awards.
* Stewardship and mentorship.
* Pre-engagement, area planning, and regulatory development.
* Restoration projects and tools.
* Aboriginal liaison program.
* Emergency management, response, and critical incident reporting.
* Compliance, enforcement, and joint inspections.
* Consultation, applications, and process refinement.

5.4.1. Learning Activity 5 - LNG Industry Communities

Instructions

1. Have the students watch videos 10, 11, 12 and 13 and visit Website 2.
2. Break the class into small groups to discuss the following questions:
   1. Are you a part of the LNG community? Do you have friends, family or neighbors who work in this industry?
   2. Do you live in a location or want to live in a location where the LNG industry operates?
   3. Did you know that there is a wide range of opportunities for where you want to live and work within the upstream, midstream and downstream sectors of LNG?
   4. Were you aware that there are resources in place to work with families and communities within the LNG community?
   5. Think about how you might become a part of the LNG community and the kinds of opportunities you are interested it.

6. Suggested Reading

Encourage students to review suggested reading on their own time, or in class if there is time at the end of the module.

* Petroleum History Society: [A Brief History of Energy Use](http://www.petroleumhistory.ca/history/cdnbeginnings.html).
* Canadian Centre for Energy Information: [Online PDF: Evolution of Canada’s Oil and Gas Industry](http://www.energybc.ca/cache/oil/www.centreforenergy.com/shopping/uploads/122.pdf).

7. Notes

Lesson Plan: Module 2.2 The Natural Gas Industry in   
British Columbia

1. Overview

This module provides information about how the natural gas industry is growing in British Columbia including the development of the liquefied natural gas (LNG) sector. The module will help students understand the scale of some of the changes and the benefits development will bring.

2. Learning Outcomes

*When you complete this module, you will be able to:*

1. Describe the basic properties of natural gas.
2. Explain why natural gas, is a preferred energy source.
3. Find current information about liquefied natural gas (LNG) projects in the province.
4. Describe common uses for liquified natural gas in day-to-day life.
5. Describe oversight of the LNG industry in B.C.
6. Describe reasons for developing positive relationships between LNG industries and Indigenous communities.
7. Describe the potential role of natural gas in the future.

3. Required Materials and Resources

1. Projector with audio.
2. Computers with internet connection; preferably one computer   
   per student.
3. Lesson Plan for WING Student Module 2.2.

4. Ice Breaker

Ask the students to compete the following exercise.

“Always remember that you are absolutely unique. Just like everyone else.

*Margaret Mead*

5. Summary of Sections and Learning Activities in the Module

5.1. Natural Gas Science

5.1.1. Natural Gas – The Simple Version

An introductory explanation of the basic properties of natural gas. Explains how natural gas, is a mixture of many other compounds.

5.1.2. Natural Gas – Chemistry

This section provides a basic understanding of chemical make-up of natural gas. The information provided for is not intended to be a highly scientific descriptions or definitions, but rather serve as an introduction to the subject matter. No advanced or high-level knowledge of chemistry is required of the students.

5.1.1.1. Matter and substance

The section explains the three states natural gas is found in on earth; and provides a introductory level explanation of the make-up of natural gas; its atoms and molecules. It also highlights how natural gas is a compound hydrocarbon, made up of many types of alkanes. A simple chart of the basic   
the hydrocarbons and alkanes found in natural gas.

5.1.1.2. Atoms and molecules

Explains that an atom is the smallest particle into which a substance can be physically separated, and that molecules are formed when two or more atoms chemically bind together.

5.1.1.3. Elements and compounds

Defines elements as substances which contain only one kind of atom. There are three types of elements: metals, non-metals, and semimetals; and that most elements are metals.

5.1.3. Natural Gas – The Physics

This section provides a basic understanding of four key concepts that are important terms for students to know and to understand the differences between them. The information provided for the terms are not intended to be a highly scientific descriptions or definitions, but rather serve as an introduction to the subject matter. No advanced or high-level knowledge of chemistry is required of the students.

The section also explains the basic units of energy used in Canada by industry and consumers joules, gigajoules, and MMBTU (One Million British Thermal Units). More detailed information can be found on any number of science-based websites.

5.1.1.1. Work

Defines ‘work.’ Work is done when a force that is applied to an object, moves that object.

5.1.1.2. Power

Defines ‘power.’ Power is the rate at which work is accomplished over time.

5.1.1.3. Energy

Defines ‘energy.’ Energy is the ability to do work.

5.1.1.4. Pressure

Defines ‘pressure.’ Pressure is the amount of force exerted per unit area (on a given surface).

5.1.4. Natural Gas – Units of Measurement

This section describes some of the most common measurement units for the natural gas, LNG, and oil industries. These include barrels, cubic meters, litres, cubic metres, cubic feet, and metric tonne.

5.1.1.1. Volume

This section outlines that natural gas is typically measured by volume, and that the amount of energy in natural gas is proportional to the number of molecules in the gas, and the number of molecules in the gas changes under different temperatures and pressures; hence, the amount of energy in natural gas varies by volume depending on the temperature and level of pressure the gas is stored under.

5.1.1.2. Measuring volume

Describes the most common terms used for measuring volume, and that the standards for measurement are set by the government of Canada.

* Video 1: [Exploding Water Heater](https://www.youtube.com/watch?v=jbreKn4PoAc) (4 minutes 12 seconds).

5.1.1.3. Learning Activity 1 Water and Pressure

This activity is based on the information in Video 1.

Instructions

1. Hold a class discussion using the following Discussion Questions:
   1. What was the water heater operating pressure?

* 300 psi.
  1. What was the pressure at the explosion time?
* 350 psi.
  1. What will happen if pressure escapes the well?
* Drilling fluid which is used to keep the gas in the formation will escape, blowing the fluid from the well.

1. Remind students that all water heaters have a factory installed, pressure relief valve which prevents over pressuring of the water heater and subsequent explosions.

5.1.5. Natural Gas Geology

The section provides an overview of how natural gas was formed over the millennia.

5.1.1.1. Primary and Secondary Natural Gas

The section explains the two types of ways natural gas is formed.

5.1.1.2. Sedimentary Basins

The section explains where petroleum and natural gas are general found under the earth’s crust.

5.1.1.3. Conventional versus Unconventional Gas

Explanation of where natural gas is found and the two main extraction approaches. Conventional oil and gas pools are developed using vertical or horizontal well bores and using minimal stimulation. Unconventional resources are oil or gas-bearing units, such as shales, where the permeability and porosity are so low that the resource cannot be extracted economically through a vertical well bore and instead requires a horizontal well bore followed by multistage hydraulic fracturing (“fracking”) to achieve economic recovery and production.

5.1.1.3.1. Shale Gas

Explanation of the term Shale Gas - natural gas produced from the fractures, pore spaces, and physical matrix of shales.

5.1.1.3.2. Tight Gas

Explanation of the term Tight Gas - natural gas produced from reservoir rocks with such low permeability that massive hydraulic fracturing is necessary to produce the well at economic rates.

* Video 2: [Unlocking Tightly Trapped Gas](https://www.youtube.com/watch?v=vO82b2auSdo) (5 minutes, 54 seconds).
* Video 3: [Lifecycle of an Onshore Well](https://www.youtube.com/watch?v=w9MMsEkadGw) (5 minutes 52 seconds).

5.1.1.3.3. Learning Activity 2 Unconventional Opportunities

These videos will help students to understand the challenges and technologies used to extract gas from tight gas formations.

Instructions

1. Have the students watch Videos 2 and 3 to answer the following questions.
2. Hold a class discussion to review their responses.
   1. What is the clearest part of these videos?
      1. From a jobs or careers perspective?
      2. From an environmental perspective?
      3. From a business perspective?
      4. From a community perspective?
   2. What is the most confusing part of these videos?
      1. From a jobs or careers perspective?
      2. From an environmental perspective?
      3. From a business perspective?
      4. From a community perspective?

5.2. Natural Gas Resources and Uses

5.2.1 Energy Sources in Canada

Outlines the major energy sources (oil, natural gas, coal, hydroelectric, biomass, nuclear, solar, wind and tidal) in Canada and their current importance.

5.2.1.1. Canada’s Energy Pie

Provides a (2019) graphic showing the percentage share of the various energies produced in Canada.

5.2.2. Versatility & Benefits of Natural Gas

This section compares natural gas benefits to other fossil fuels and renewable energy technologies.

5.2.3. Natural Gas Use

This section outlines the various uses of natural gas by the four-key market segments.

5.2.3.1. Residential Uses

5.2.3.2. Commercial Uses

5.2.3.3. Industrial Uses

5.2.3.4. Transportation Uses

5.2.3.5. Video 4: [Natural Gas 101](https://www.youtube.com/watch?v=-njmj0diWu8) (03 minutes, 39 seconds).

5.2.3.6. Learning Activity 3 Find Out About Natural Gas Components, Sources, and Uses

Instructions

1. Ask the students to answer the following questions and then discuss the questions as a class.
   1. What are the components of natural gas when it comes out of the ground?
      * Methane, ethane, propane, butane, and pentane. carbon dioxide, nitrogen, hydrogen sulfide, oxygen and helium.
   2. Where are the sources of natural gas in British Columbia?
      * Western Canada Sedimentary Basin – Montney, Horn River, Duvernay and Liard formations.
      * There are other Basins and Troughs in BC, however, there are no known future exploration plans outside of the Western Canada Sedimentary Basin.
   3. What are the uses of natural gas?
      * Source of energy for heating, cooking, and electricity generation. It is also used as a fuel for vehicles and as a chemical feedstock in the manufacture of plastics and other commercially important organic chemicals.

5.3. Oversight of the Natural Gas Industry

5.3.1. BC Oil and Gas Commission

Brief description of the BC Oil and Gas Commission and its role and responsibilities in overseeing the industry’s activities in British Columbia.

5.3.2. Term Definitions

Definitions of the various terms and Acts that regulate the natural gas and LNG industry.

* Crown Corporation.
* The Canada Oil & Gas Act.
* The Forest Act.
* The Heritage Conservation Act.
* Land Act.
* Environmental Management Act (EMA).
* The Canada Water Act.

5.4. Understanding Land Rights and Natural Gas

Brief explanations of crown land, treaty land, treaties, ceded and unceded land, and pre-engagement.

5.4.1. Crown Land

Crown land is the term used to describe land owned by the federal or provincial governments.

5.4.2. Treaty Land

Treaties constitutionally entrench reconciliation between: First Nations, Canada, and British Columbia.

5.4.3. Unfinished Business

Brief overview of history of treaty negotiations with the Indigenous peoples of Canada and British Columbia leading up to the 1973 Supreme Court ruling. Notes how the provinces joined the negotiation process in 1990.

5.4.4. Ceded and Unceded Land

‘Unceded’ means that the First Nations people never ‘ceded’ or legally signed over their lands to the Crown or Canada. Ninety-five percent of British Columbia, including Vancouver sits on traditional First Nations territory. A traditional territory is the geographic area identified by a First Nation as the land they and/or their ancestors traditionally occupied, lived on or used.

5.5. Pre-engagement

This section briefly outlines the considerations and planning required for new energy projects, that impact Indigenous people and communities. Notes that companies must undertake to understand the rights of Indigenous peoples, document and address their particular needs and concerns, as well as understand Indigenous values, practices, activities, customs or traditions that are connected and undertaken in relation to their identified rights.

5.5.1. Canadian Energy Regulator (CER) Act & Early/Pre-engagement

Highlights the Government of Canada’s commitment to using transparent processes that build on early engagement and inclusive participation, and under which the best available scientific information and data as well as Indigenous knowledge are taken into account in the decision-making on new energy projects.

5.5.2. Website 1: [BC Oil & Commission](https://www.bcogc.ca/)

5.5.3. Acknowledging Traditional Ways of Being

An introductory discussion regarding protocols (‘rules or manners’) that are recommended when interacting with Indigenous people. Also provides an overview and some recommendations to use land acknowledgements prior to the start of any meetings or events.

**5.5.3.1. Learning Activity 4[[1]](#footnote-2)** **Practicing Land Acknowledgement**

Drawing on the information in the above section, ask the students to practice a version of their own land acknowledgement.

Instructions

1. Ask students to pair up with another student.
2. Instruct students to take turns practicing the land acknowledgement exercise with classmate.
3. Refer students to the land acknowledgement examples shown in the student module, which they may want to use.

5.6. Royalties and Investment in the Future

5.6.1. Natural Gas Royalties

Brief description of what natural gas royalties are and their purpose.

5.6.2. British Columbia Prosperity Fund

Brief description of the BC Prosperity Fund and its purpose.

5.7. Energy and the Future

In March 2014, National Geographic and Shell convened a group of experts in Vancouver to discuss the role of natural gas in our energy future. Video 5 shows the discussion which focused on two questions. Answers are noted below with a check mark.

1. Which three words come to mind when you think about natural gas as part of the energy mix?
   * Abundant, reliable, affordable, versatile, cleanest fossil fuel, economic opportunity.
2. Are we entering a global age of gas and if so, what will we see change and when?
   * Sourcing lower carbon emitting sources of energy to   
     replace coal.

5.7.1. Video 5: [Natural Gas: A Bridge to a Sustainable Energy Future](https://vimeo.com/showcase/2869286/video/94997184)   
(04 minutes, 49 seconds)

5.7.2. Learning Activity 5 Take Part in an Energy News Conference

Instructions

1. In this learning activity, students take turns being industry experts and journalists. The activity is intended to be conducted as a news conference, where journalists interview a group of industry experts.
2. For this exercise, the questions and discussion will focus on the same two questions used in Video 5 plus one additional question (shown below).
3. This is an opportunity for students to demonstrate their understanding of what was presented, and to see what they have learned and what opinions they have formed regarding energy and its use in the future.
4. Get everyone up on their feet.
5. Divide the class into two groups and assign one group to be the journalists and the other to be the industry experts.
6. Using the news conference questions below, have the journalist students interview the industry expert students as done in Video 5; as the instructor, you can be the Communications Director and moderate the questions and answers.
7. Switch roles, so everyone has an opportunity to be both a journalist and an industry expert.
8. After the news conference, discuss as a class, the common words that came up, how students see the future of natural gas, and what perspective about natural gas energy do students see themselves taking in the future.

News Conference Questions

1. What three statements of fact come to mind when you think about natural gas as part of the energy mix?
   * Cleanest fossil fuel source.
   * Abundance of supply.
   * Affordable.
   * Economic opportunity.
2. Are we entering a global age of natural gas and if so, what will we see change and when?
   * Transitioning from coal fired and diesel fired power generation to other less carbon intensified sources of energy including natural gas and alternative energy sources such as solar, wind and biomass.
3. What does natural gas or liquefied natural gas (LNG) mean for you and your life?
   * Lower carbon emissions on a global scale as LNG allows Canada to ship natural gas around the world to replace higher carbon energy sources for electric power and heating.

6. Suggested Reading

* Our Petroleum Challenge - Sustainability into the 21st Century, Eighth Edition, Online PDF Version, Canadian Centre for Energy Information.
  + Section 1– Petroleum in Our Lives, Chapter 2 – Oil and Gas in Canada, pages 14 – 23.
* Websites
  + [Natural Gas in BC](http://www.energybc.ca/index.html).
  + [Online PDF: Natural Resources Canada: Energy Fact Book 2018-2019](https://www.nrcan.gc.ca/sites/www.nrcan.gc.ca/files/energy/pdf/energy-factbook-oct2-2018%20(1).pdf).
  + [Online PDF: CAPP: Canada’s Natural Gas](https://www.capp.ca/wp-content/uploads/2019/11/Natural_Gas_Fact_Book-349656.pdf).
* Useful Twitter Feeds to Consider:
  + Canadian Society for Unconventional Resources - csurryyc@CSURyyc.
  + JWN Energy – JWN@JWNergy.
  + Energy Citizens – Energy Citizens@Energy\_Citizens.

7. Notes

Lesson Plan: Module 2.3 Well Site Selection, Preparation and Drilling, Completion, Production, Water Recycling, and Reclamation

1. Overview

This module introduces key processes in the upstream sector of the natural gas industry—well site selection, preparation, and drilling, completion, production, water recycling, and reclamation.

Note, for this and the subsequent two modules, it is important to make students aware that there is variation within the industry in terms of the classification system used to define sectors. Some individuals use a three-sector classification (upstream, mid-stream, downstream), while others use a two-sector classification system (upstream and downstream). In the two-sector model, everything referred to as mid-stream processing (in the three-sector system) is included in the downstream sector.

A ***New Vocabulary*** section and associated ***Learning Activity 8*** are included near the end of this module because of the number of new industry-specific terms introduced in the module. Instructors are encouraged to have students complete Learning Activity 8 on their own after class, and then review the new terminology with students on the next day.

2. Learning Outcomes

When you complete this module, you will be able to:

1. Understand how a natural gas well site is selected and prepared for drilling including social and environmental considerations.
2. Describe drilling processes including advantages and disadvantages of different drilling methods.
3. Understand completion including hydraulic fracturing.
4. Understand the role and importance of water in upstream natural gas processing.
5. Understand how a well site is reclaimed including environmental considerations.

3. Required Materials and Resources

1. Projector with audio.
2. Computers with internet connection; preferably one computer   
   per student.
3. Lesson Plan for WING Student Module 2.3.

4. Ice breaker

"Be careless in your dress if you will but keep a tidy soul."

Mark Twain

5. Summary of Sections and Learning Activities in the Module

5.1 Industry Sector Classifications

This and the next two modules focus on describing processes, features, and other characteristics of the natural gas industry by sector. Looking at activities by sector makes it a bit easier for students to better understand just what is involved in taking natural gas from the ground and ultimately delivering it to market for residential, industrial, and commercial uses.

Ensure students understand that there are two ways to classify the sectors. In the WiNG program, the natural gas industry is described using a three-sector classification system: upstream, midstream, and downstream. The industry is sometimes referred to as a two-sector system: upstream and downstream. In the two-sector system, all of what is referred to as midstream processing in the WiNG program is included in the downstream sector.

5.2. The Upstream Sector

5.2.1. Extraction and Processing

This section of the student module highlights the key processes (shown below) involved in the upstream sector of the industry.

* Exploration and site selection.
* Well pad preparation and drilling.
* Completion.
* Production.
* Water recycling.
* Site reclamation.

Students will learn about the various natural gas processes by watching a series of videos (videos 1 through 8). Other than Video 7 which was filmed in Dawson Creek, all of these videos were filmed in the Marcellus Shale region of the Eastern United States. The processes are virtually the same here in British Columbia. These resources are offered in the absence of a similar British Columbian or Canadian resource.

The videos are followed by Learning Activities 1 through 6, where students are asked to answer a series of questions. Watching the videos and completing this set of learning activities takes time and should not be rushed.

1. Encourage students to watch the videos as many times as necessary.
2. Have students to make note of questions they are not able to answer; encourage them to ask a classmate to help them with the answer.
3. Students can work alone or in pairs.

The videos and learning activities are included below for reference. For the instructor’s convenience, answers have been provided for some of the questions.

5.2.1.1. Exploration and Site Selection

These videos will help students to understand the challenges and technologies used in exploration and site selection.

* Video 1: [Exploration: How Chevron Uses Seismic Technology](https://www.youtube.com/watch?v=npPwVcdixRU&feature=youtu.be)   
  (2 minutes 3 seconds).
* Video 2: [Drilling Site Selection](https://www.youtube.com/watch?v=npPwVcdixRU&feature=youtu.be) (2 minutes 32 seconds).

5.2.1.1.1. Learning Activity 1 Exploration and Site Selection

Instructions

1. Watch Videos 1 and 2 and answer the following questions.
2. Have the students watch Videos 1 and 2.
3. Hold a class discussion using the following Discussion Questions.
4. What are the 6 basic steps in developing and producing natural gas?
   * Exploration and or Site selection.
   * Well pad preparation and drilling the well.
   * Completion of the well.
   * Gas production and marketing.
   * Aqua Renew or Water Recycling.
   * Reclamation of the wellsite.
5. How does site selection begin?
   * 3D seismic.
6. What benefit does 3D Seismic provide?
   * Highly focused view of subsurface to pinpoint drilling locations.
7. How are sound waves sent underground?
   * Explosive charges or vibration trucks depending on land contours.
8. Where do the sound waves go and why?
   * Sound waves go through the subsurface and bounce back up to the surface from each rock formation.
9. How are the sound waves recorded?
   * Captured through geophones on surface which sends signals to a recording truck.
10. What steps might a natural gas exploration company take in selecting a site for drilling?
    * Landman meets with residents and neighbouring stakeholders to share plans and listen to issues and concerns. In Canada, companies are required to consult with all stakeholders including Indigenous communities.
11. What considerations are taken in the location of the proposed site?
    * Water features.
    * Vegetation.
    * Access roads.
    * Schools.
    * Wetlands.
    * Heritage and cultural features.
    * Other environmental, health or social aspects that could   
      be impacted.
12. What kind of rocks hold oil and natural gas?
    * Reservoir rocks.
13. How many seismic squiggles are needed to make a “cross section”?
    * Thousands.
14. What three types of specialists make up an exploration team?
    * Geologist, Geophysicist, Reservoir Engineer.
15. What is a good success rate in exploration?
    * 50%.

5.2.1.2. Preparation and Drilling

This video will help students to understand well pad preparation and the drilling process.

* Video 3: [Well Pad Preparation and Drilling in the Marcellus Shale](https://www.youtube.com/watch?v=PF3dzivVI-o&list=%20PL75C02A0B1F8%20CEF3F%20&index=2)   
  (8 minutes 55 seconds).

5.2.1.2.1. Learning Activity 2 Well Pad Preparation and Drilling

Instructions

1. Have the students watch Video 3 and answer the following questions.
2. Hold a class discussion using the discussion questions.
   1. What is prepared before drilling begins?
      * Well pad is constructed.
   2. Where do drilling operations occur?
      * Mostly in rural areas where hydrocarbons are believed to exist in the subsurface.
   3. What are the key steps taken to protect the environment in well pad preparation?
      * 30-millimeter liner under the well pad.
      * Rubber composite mat under rig.
   4. How many levels of containment do diesel tanks have?
      * 5 levels of containment.
   5. What is an earth berm and what does it do?
      * Designed and constructed to surround the drilling location to direct surface water for collection and cleaned, to be used either within the drilling operations, or disposed of.
   6. How many well types are used to drill for and produce natural gas? What are they?
      * Two - Vertical and horizontal.
   7. Why is horizontal drilling preferable to vertical drilling?
      * Better hydrocarbon recovery per well due to a longer section of wellbore being through the reservoir rock.
      * Reduced surface land footprint and lower capital cost.
      * Lower environmental impact.
   8. How many well pads are needed for vertical drilling vs. horizontal drilling?
      * The same ratio as the length of reservoir rock drilled on the horizontal well compared to that on vertical well.
   9. How long does it take to drill one well?
      * Dependent on how deep the well is. Drilling takes place 24 hours a day, 7 days per week.
   10. What two things take place while drilling the well to protect the environment and secure it for production?
       * Installation of casing.
       * Cementing casing in place in the wellbore.
   11. What is steel casing? What is it used for? Why is it important?
       * Steel casing is pipe which is run into the well. It forms a major structural component of the wellbore and serves several important functions including preventing the formation wall from caving into the wellbore, isolating the different formations to prevent the flow or crossflow of formation fluid, and providing a means of maintaining control of formation fluids and pressure as the well is drilled.
   12. When does the drilling and casing process finish? How is it determined?
       * When total depth has been reached, which is when all targeted reservoir rock has been drilled.
   13. How is the drilling process controlled?
       * From a drilling rig.
   14. What does the rig do?
       * It is used to drill the well.
   15. What is tripping in and tripping out of the hole?
       * When drill pipe is run in and pulled out of the well respectively.
   16. What is one thing that is done before the rig is brought onsite?
       * After the well location is constructed, a conductor pipe is installed through which the well is drilled.
   17. What does conductor casing do?
       * The conductor prevents the ground from eroding when drilling is commenced.
   18. How far does surface casing extend? What purpose does it serve?
       * Dependent on the well location but generally 100 – 150 metres.
       * Isolates and protects freshwater aquifers.
       * Provides a structure for the blow-out-preventer to be installed.
       * Provides structural support for the remainder of the casing strings.
   19. When is air used instead of drilling fluid to drill the well?
       * It cleans drilled formation cuttings from the well. Since air doesn’t provide any hydrostatic pressure it can only be used when there is no risk of hydrocarbons. It is used because drilling goes much faster hence reducing cost and environmental impact by avoiding the need for disposing of fluid.
   20. The deeper the well; the smaller or bigger the drill bit used?
       * As you drill deeper into the well bore, the drill bit becomes smaller.
   21. What is production casing?
       * Its’s the last string of casing which is installed through the production or pay zone of the well. It’s typically cemented into place to ensure an effective completion or hydraulic fracturing treatment.
   22. What is the production zone?
       * A reservoir or a portion of reservoir that has been identified as an area from where a commercially viable volume of hydrocarbons can be extracted.
   23. What is drilling fluid or mud and why is it used?
       * A mixture of clay and other chemicals that is circulated around the drill bit in order to lubricate and cool the bit, flush rock cuttings to the surface, plaster the side of the well to prevent cave-ins, and provide hydrostatic pressure to prevent hydrocarbons from flowing out of the formation.
   24. What happens to the rock cuttings and used mud?
       * The rock cuttings are screened out of the liquid [mud](https://www.glossary.oilfield.slb.com/Terms/m/mud.aspx) system at the shale shakers and are monitored for composition, size, shape, color, texture, [hydrocarbon](https://www.glossary.oilfield.slb.com/Terms/h/hydrocarbon.aspx) content and other properties. The mud is further cleaned and screened and reused.
   25. What is the “blow out preventer” or “B.O.P.”?
       * Equipment installed on surface to contain any unplanned pressure release from the wellbore that may occur as a result of the hydrostatic pressure of the mud being less than the pressure of the hydrocarbon. The BOP is a significant safety device during drilling operations.
   26. When is the “B.O.P.” installed?
       * After surface casing has been run and cemented.

5.2.1.3. Completion

This video will help students to understand the well completion process.

* Video 4: [Natural Gas Well Completion in the Marcellus Shale](https://www.youtube.com/watch?v=PF3dzivVI-o&list=%20PL75C02A0B1F8%20CEF3F%20&index=2)   
  (4 minutes 53 seconds).

5.2.1.3.1. Learning Activity 3 Completion and Hydraulic Fracturing

Instructions

1. Have the students watch Video 4 and answer the following questions.
2. Hold a class discussion using the discussion questions:
   1. What is completion?
      * An operation that takes place which enables the flow of hydrocarbons to the surface.
   2. When does completion take place?
      * After the wellbore has been drilled.
   3. How does it begin?
      * In an unconventional reservoir it starts with hydraulic fracturing to stimulate hydrocarbons. In a conventional reservoir, hydraulic fracturing is not required.
   4. What is protecting the ground water near well pad sites?
      * Casing cemented in the well protects ground water encountered by the well.
      * Multiple layers of surface containment and an earth berm protect water surrounding the well pad site.
   5. How long does a “frac” job take?
      * An individual frac takes approximately 4 hours. The number of individual fracs on a well is varied and well dependent.
   6. Explain how water is used in the process.
      * Water under pressure is used to create the frac. Sand is pumped into the fracture using water in order to keep the fracture open once pressure is released.
   7. What is a “frack stack”?
      * A set of valves and fittings, commonly referred to as a [Christmas tree](https://www.glossary.oilfield.slb.com/Terms/c/christmas_tree.aspx), installed on a well at surface specifically for the fracturing process.
   8. What is “proppant” and what does it do?
      * Sized particles mixed with [fracturing fluid](https://www.glossary.oilfield.slb.com/Terms/f/fracturing_fluid.aspx) to hold fractures open after a [hydraulic fracturing](https://www.glossary.oilfield.slb.com/Terms/h/hydraulic_fracturing.aspx) treatment. In addition to naturally occurring grains, man-made or specially engineered proppants, such as -coated sand or high-strength ceramic materials like bauxite, may also be used. Proppant materials are carefully sorted for size and sphericity to provide an efficient conduit for [production](https://www.glossary.oilfield.slb.com/Terms/p/production.aspx) of fluid from the [reservoir](https://www.glossary.oilfield.slb.com/Terms/r/reservoir.aspx) to the wellbore.
   9. What is in “fracking fluid”? What does it do?
      * Fracking fluid (or frac fluid) is a chemical mixture used to convey and place proppant into a fracture to keep it open when pressure is released after the fracking operation is completed.
   10. What is “produced water”?
       * Water produced from a wellbore that was resident in the formation and not part of the [treatment](https://www.glossary.oilfield.slb.com/Terms/t/treatment_fluid.aspx) fluid process.
   11. What is a “service rig” or “workover rig”? What is it used for?
       * Just as a Drilling Rig is used to drill a well, a Service Rig is used to service or performing maintenance activities on a well. A service rig as also used to conduct completion operations on a well.
   12. What is the “Christmas Tree?” What is its function?
       * An assembly of valves, spools, pressure gauges and chokes fitted to the [wellhead](https://www.glossary.oilfield.slb.com/Terms/w/wellhead.aspx) of a completed well to control [production](https://www.glossary.oilfield.slb.com/Terms/p/production.aspx).
   13. How is the Christmas Tree operated?
       * Either manually by an operator going to the wellsite or remotely with the use of hydraulically actuated valves.
   14. What is the first product of a new well?
       * Produced brine and water.
   15. How long can a well-head be used?
       * For the life of the well operations and production.

5.2.1.4. Production

This section describes the processes involve in readying natural gas from the well for commercial use and transportation

5.2.1.4.1. Gas Processing

Defines the various terms used to describe natural gas and the pipeline distribution routes for natural gas in BC. This video will help students to understand gas production and its distribution.

5.2.1.4.2. Video 5: [Natural Gas Production and Marketing in the Marcellus Shale](https://www.youtube.com/watch?v=2Gw_Bn-JqDg) (9 minutes 43 seconds).

5.2.1.4.3. Learning Activity 4 Production

Instructions

1. Have the students watch Video 5.
2. Hold a class discussion using the following Discussion Questions:
   1. Is natural gas ready for sale straight from the well? Why or   
      why not?
      * No as it contains water from the formation, as well as other impurities that must be removed.
   2. What preventative measures are in place to protect the environment in this phase of production?
      * Christmas tree to control wellhead pressures.
      * Computerized and pneumatic devices to control gas flow.
   3. What does a “separator” do?
      * Separates water, oil and gas form one-another.
   4. What does a “sales meter” do?
      * Measures the volume of hydrocarbons shipped via pipeline to customers.
   5. What is a “CDP?”
      * Central delivery point where gas is collected from producing wells and receive further processing and compression.
   6. What is a “dehydrator?” What does it do?
      * Equipment that further separates water from gas.
   7. What is “glycol?”
      * A fluid that bonds with water used to remove minute water particles from natural gas that were too small to be removed using separators.
   8. What are pipelines used for?
      * To transport gas from the well for further processing and to customers.
   9. What are some preventative measures that are taken when installing a new pipeline?
      * Right of way is cleared and graded.
      * Land is restored and re-vegetation is performed with native plants.
   10. What is a “silt fence” and a “silt sock” and what are they used for?
       * To keep surface run off of soils.
   11. What is the purpose of the coating on the outside of the pipe used in the pipeline?
       * To protect pipe from corrosion and pitting.
   12. How are the sections of pipe joined?
       * By welding.
   13. Why is the pipeline x-rayed?
       * To confirm there are no welding defects.
   14. How is the pipeline tested before gas is pumped through it?
       * Pipe is pressure tested with water or an inert gas.
   15. What steps are taken to check for leaks after the pipeline is installed?
       * The pipeline is hydrostatically tested for leaks.

5.2.1.5. Water Recycling

1. These videos will help students to understand the challenges and technologies used to reclaim the water used in the drilling process.

* Video 6: [Aqua Renew Water Recycling in the Marcellus Shale](https://www.youtube.com/watch?v=swNaEXozecw&list=PL75C02A0B1F8CEF3F&index=5)   
  (2 minutes 6 Seconds).
* Video 7: [Minimizing Our Need to Use fresh Water for Hydraulic Fracturing: Dawson Creek](https://www.youtube.com/watch?v=YilQHTPIEE0&feature=youtu.be) (5 minutes, 42 seconds).

5.2.1.5.1. Learning Activity 5 Water Recycling

Instructions

1. Have the students watch Videos 6 and 7
2. Hold a class discussion using the following Discussion Questions:
   1. In terms of using water efficiently to produce energy, how does natural gas compare with other sources?
   2. Natural gas production uses X % less water than coal production.
      * 80%.
   3. What happens with the water used in natural gas drilling?
      * Cleaned, stored and recycled for future drilling and hydraulic fracturing operations.
   4. What are three benefits to recycling water used in natural gas production?
      * Minimizes freshwater use.
      * Minimizes truck traffic.
      * Less road wear and tear on public roads.

5.2.1.6. Reclamation

This video will help students to understand the reclamation process used on   
well sites.

* Video 8: [Well site reclamation in the Marcellus Shale](https://www.youtube.com/watch?v=aoFUOwZPkwg&list=PL75C02A0B1F8CEF3F&index=6)   
  (2 minutes, 14 seconds).

5.2.1.7. Learning Activity 6 Site Reclamation

Instructions

1. Have the students watch Video 8.
2. Hold a class discussion using the following Discussion Questions:
   1. How big is the well site before and after drilling?
      * Dependent on the number of wells on the site. Multi-well sites are preferred since they require a smaller footprint per well.
   2. What steps are taken to restore the site to its original pre-drilling state?
      * Remove gravel and hauled away.
   3. Topsoil that was stockpiled is placed back where the well pad once was?
      * Replant vegetation.
   4. What remains on the site after the reclamation?
      * There are no visible remaining items once reclamation has been completed.
   5. What effect does the truck traffic to the site have on the surrounding roadways?
      * Without mitigation efforts, the condition of the road will deteriorate. Through upgrades and repairs however, roads are left in the same or better condition than prior to drilling operations.
   6. What is a “shut in well?”
      * A well where the surface valves are closed to stop it from producing.
   7. What is “temporary abandonment” of a well site?
      * When a barrier is placed inside the well in addition to surface valves being closed.
   8. What does “P & A” stand for? What does it involve?
      * “Plug and Abandon.” At the end of a well’s productive life, it is plugged and abandoned by placing cement and heavy mud downhole, removing the wellhead, cutting the casing off 1 to 2 metres below the surface of the ground and welding a steel plate over the top.
   9. What are the chief concerns when abandoning a well?
      * That it can be left indefinitely without risk of hydrocarbons leaking to surface, and will not damage freshwater supplies, potential petroleum reservoirs, or the environment.
   10. What is the cleanest fossil or plant-based fuel?
       * Natural gas, and is more water efficient than other fossil and plant-based fuels.
   11. What stated benefits of producing natural gas in the U.S. would also be beneficial here in British Columbia?
       * Creates significant economic contribution to British Columbians and reduces taxes for provincial services.

5.3. Upstream Companies and Jobs in British Columbia

5.3.1. Companies

A high-level overview of the type of companies operating in the upstream natural gas sector in British Columbia. Discusses how these larger companies most often hire third party firms referred to as contractors and describes some of the specialized services these contractors provide. Highlights the broad range of jobs and career opportunities beyond those most people usually associate with natural gas.

5.3.2. Careers

This section lists and showcases the substantial range of rewarding career opportunities for students in upstream natural gas across several disciplines. Roles and experience level within each of the careers range from junior through to management are listed in the accompanying table. Note that Module 2.9 provides additional information on careers in these and other occupations.

5.3.3. Industry Associations

This section contains a list of industry associations and links to their websites. Highlight for the students the fact that these websites are often valuable sources of information for individuals looking for jobs and careers in natural gas. Students should be encouraged to search through multiple websites as these can e organized across business lines or occupations. In addition, many upstream firms belong to multiple associations.

* Website 1 [Energy Services BC (Independent Contractors and Businesses Association)](https://icba.ca/esbc/).
* Energy Services BC represents companies providing services to the oil and gas industry in British Columbia. The association is now operating within the Independent Contractors and Businesses Association.
* Website 2 [Canadian Association of Oilwell Drilling Contractors (CAODC)](https://caodc.ca/AF_MemberDirectory.asp).
* The CAODC is a trade association representing upstream Canadian petroleum drilling contractors -- land-based and offshore, service rig contractors and associate companies.
* Website 3 [Canadian Association of Petroleum Producers (CAPP)](https://www.capp.ca/about/membership/).
* CAPP represents upstream oil and natural gas companies in Canada who explore for, develop, and produce natural gas, crude oil, oil sands and elemental sulphur.
* Website 4 [Petroleum Services Association of Canada (PSAC)](https://www.psac.ca/).
* PSAC is the national association of Canadian oilfield service, supply and manufacturing companies.
* Website 5 [Canadian Energy Pipeline Association (CEPA)](https://cepa.com/en/about-us/careers/).
* CEPA represents firms in the transmission pipeline industry in Canada.
* Website 6 [Canadian Gas Association](https://www.cga.ca/).
* CGA represents major gas distribution and transmission companies and appliance and equipment manufacturers   
  in Canada.
* Website 7 [Canadian Association of Geophysical Contractors (CAGC)](https://www.cagc.ca/).
* The CAGC acts as the communication link to promote understanding between Government, industry, other groups and the geophysical industry and develops, administers and promotes programs and training to ensure worker health and safety.
* Website 8 [Explorers and Producers Association of Canada (EPAC)](https://www.explorersandproducers.ca/membership/membership-list-3/).
* EPAC represents a wide spectrum of independent oil and gas companies ranging from start-ups to junior and mid-sized producers operating in Canada, the United States and around   
  the world.

5.3.3.1. Learning Activity 7 Self-Directed Research

This is a self-directed learning activity that you can do on your own.

Instructions

1. Ask students to visit the websites of the industry associations listed and review each association’s membership lists.
2. Remind students that industry associations are a good place to look for employers they may be interested in working for.

5.3.4. Professional Associations

This section contains a sampling of professional and technical associations and societies, and their respective websites. These websites offer insights and invaluable information for individuals looking for careers in natural gas.

Explain to students that professional and technical associations are usually organized around the occupation (i.e., geologist, geophysicist, engineers, surveyors, etc.) or area of responsibility (i.e., landmen, land administrators, drilling engineers, technicians, technologists, etc.). Most of these associations are national in scope, but some are provincial. It is not unusual for an individual to belong to one or more associations.

* Website 9 [Association of Consulting Engineering Companies - Canada (ACEC)](https://www.acec.ca/).
* ACEC is the not-for-profit organization for Canadian consulting engineering companies, representing the commercial interests of businesses that provide professional engineering services, to both the public and the private sector.
* Website 10 [Applied Science Technologists and Technicians of BC (ASTTBC)](https://asttbc.org/).
* ASTTBC is a not-for-profit organization that provides professional certification of technologists and technicians in BC for sixteen disciplines and nine special certifications in the broad field of applied science.
* Website 11 [Canadian Association of Professional Landmen (CAPL)](https://www.landman.ca/).
* The CAPL is a non-profit voluntary professional association for landmen in Canada. A mineral landmen is an integral part of an exploration and development team of professionals that includes engineers, geologists and geophysicists and is directly involved in the acquisition, disposition and management of a company’s most important asset – its petroleum and natural gas rights.
* Website 12 [Canadian Association of Petroleum Land Administration (CAPLA)](http://caplacanada.org/).
* CAPLA members are land administration professionals who work in the energy industry managing the entire land asset life cycle, from the time a parcel of land is acquired, through the exploration and development stages, and during the final disposition or reclamation phase.
* Website 13 [Association of Canada Land Surveyors (ACLS](https://www.acls-aatc.ca/)).
* The ACLS is the national licensing body for professionals surveying in the three Canadian territories, in the Federal parks, on First Nation reserves, on and under the surface of Canada’s oceans.
* Website 14 [First Nations Limited Partnership](http://bcfnlp.ca/).
* The First Nations (PTP) Group Limited Partnership (FNLP) comprises 16 First Nations in B.C. who together negotiated and concluded a precedent-setting commercial benefits agreement regarding the Pacific Trail Pipelines (PTP) project.
* Website 15 [First Nations LNG Alliance](https://www.fnlngalliance.com/projects/first-nations-limited-partnership/).
* This group advocates on behalf of First Nations by providing in-depth research and insight in the many issues and concerns surrounding LNG development in B.C. They seek to connect people with resources, information, and support.

* Website 16 [Careers in Oil + Gas](https://careersinoilandgas.com/what-is-lmi/career-resources/).
* Information regarding additional Canadian technical/ professional societies and associations can be found at this website.

5.4. New Vocabulary

5.4.1. Learning Activity 8 Learning New Terminology Instructions

1. Review the New Vocabulary list in the student module (also shown below) with students.
2. Ask students to write descriptions for each term listed, on their own, and be prepared to discuss them with the class.

5.4.1.1. Terms and Definitions

1. Blow Out Preventer (BOP).
   * A Blow Out Preventer is a set of specialized valves installed on the well head, which is used to contain any unexpected pressure from escaping the well during drilling, completions, or maintenance operations.
2. Surface Casing.
   * The first string of casing to be set and cemented in a well, the principal purpose of which is to protect freshwater aquifers. It also prevents lost circulation while drilling deeper, supports blowout prevention equipment (if used), and supports deeper casing strings and the tubing.
3. Conductor Casing.
   * A casing string which is often set and cemented at a shallow depth to support and protect the top of the borehole from erosion while circulating and drilling the surface casing hole.
4. Casing Shoe.
   * A tool connected to the bottom of a string of casing designed to guide the casing past irregularities in the open hole; usually rounded at the bottom in shape and composed of drillable materials.
5. Kick off Point (KOP).
   * The point at which a directional well is intentionally deviated from vertical.
6. Measuring While Drilling (MWD).
   * The measurement of physical properties while drilling, such as pressure, temperature and borehole trajectory, by tools installed in the BHA.
7. Wellhead.
   * A structure of valves, spools and fittings. Wellhead is a structure that is installed on or at the top of a oil or natural gas a well to ensure a safe operation and manage the flow of hydrocarbons oil or gas from the well into the gathering-system. It is a system composed of valves, spools and assorted adapters that control the pressure of the production well.
8. Christmas Tree.
   * An assembly of valves, fittings, chokes, and gauges used in monitoring and controlling producing, injection, and inactive wells.
9. Drilling Fluid (Mud).
   * Water or oil-based fluid that is circulated down the drill pipe into the well and back up the annulus to the rig for purposes including containment of formation pressure, the removal of cuttings, bit lubrication and cooling, treating the wall of the well, and acting as a media for the pulsed transmission of well and drilling data to surface.
10. Rock Cuttings.
    * Drill cuttings or rock cuttings and related mineral residues generated during the drilling of an oil or gas well.
11. Total Depth (TD).
    * depth to which the well has been drilled or the depth to which it was plugged back.
12. Tripping In.
    * The act of running the drillstring into the hole.
13. Tripping Out.
    * The act of pulling the [drillstring](https://www.glossary.oilfield.slb.com/en/Terms/d/drillstring.aspx) out of the hole.
14. Top Drive
    * A top drive (frequently also referred to as a power swivel) is a piece of equipment that serves the following functions:
      1. Rotating the drill string (formerly undertaken by the rotary table).
      2. Providing a conduit for drilling mud (formerly undertaken by the rotary swivel).
      3. Disconnecting/connecting pipe (formerly undertaken by the iron roughneck).
      4. Closing in the drill pipe by an integrated kelly valve (formerly undertaken by the kelly valve in connection with the rotary table).
      5. Lifting/lowering drill string by use of standard elevator (formerly undertaken by the hook by using same kind of elevator).
      6. Top drives may be either electrically or hydraulically driven. If they are hydraulically driven, several hydraulic motors are normally used.
15. Hydrostatic Testing
    * Test performed by filling a length of pipe with water and pressurizing it in order to verify its ability to withstand a specified pressure without leaking or rupturing.
16. Plug and Abandonment (P&A).
    * The cementing of a well, the removal of its associated production facilities, the removal or abandonment in-place of its flowline, and the remediation and reclamation of the wellsite.

6. Suggested Reading

* Our Petroleum Challenge - Sustainability into the 21st Century, Seventh Edition, 5th printing, Centre for Energy.
* Section 2 - Inside the Industry.
* Chapter 1 – Exploration. pages 26-34.
* Chapter 2 – Drilling. pages 34 – 42.
* [A Primer of Oilwell Drilling: A Basic Text of Oil and Gas Drilling, 7th Edition](https://www.academia.edu/39059371/A_Primer_of_Oilwell_Drilling_A_Basic_Text_of_Oil_and_Gas_Drilling_Seventh_Edition) by Dr. Paul Bommer. University of Texas©.

7. Notes

Lesson Plan: Module 2.4 Midstream: Transportation, Processing, Refining

1. Overview

This module provides information about activities that happen in the midstream sector of the natural gas industry in British Columbia. Remind students that the program looks at the natural gas industry within a three-sector classification system, although they may hear reference to the industry as having only two-sectors. In a two-sector system, the midstream and downstream sectors are combined.

Learning activities in this module are designed to help students see their own learning by asking them to make comparisons between what they know at the beginning and end of different sections of the module.

2. Learning Outcomes

1. Identify midstream natural gas processing activities.
2. Identify four considerations related to building and operating natural gas pipelines.
3. Name and describe four methods of storing natural gas.
4. Explain how liquefied natural gas (LNG) is created and transported to market.
5. Identify companies and jobs in the midstream sector.

3. Required Materials and Resources

1. Projector and audio.
2. Computers with internet connection; preferably one computer per student.
3. Lesson Plan for WING Student Module 2.4.

4. Icebreaker

“I destroy my enemies when I make them my friends.”

Abraham Lincoln

5. Summary of Sections and Learning Activities in the Module

5.1. Suggested Reading

Review any suggested reading from the previous day.

5.2. Quick Review

5.2.1. Industry Sector Classification

Remind students that we are using a three-sector classification system to look at the natural gas industry in British Columbia. Students may hear reference to a two-sector system, where the midstream and downstream sectors are treated as one. The focus of this module is the midstream sector.

5.2.2. A note about learning activities in this module

Note and review with students that the learning activities in this module are opportunities for them to demonstrate:

* What they already know.
* What they are learning.
* What they have learned.

The learning activities are all structured in the same way and link together.

5.3. The Midstream Sector

5.3.1. Introduction

5.3.1.1. Learning Activity 1 What Do You Know About the Processes Taking Place in the Midstream Sector?

Instructions

1. Before starting this module, ask students to write down three things that they think they know about processing activities that take place in the midstream sector of the natural gas industry.
2. Encourage students to be as detailed as they can about what happens to the gas and what types of jobs are involved.
3. Have students keep the paper for use later in the module.

5.3.2. Processing Natural Gas

This section describes the general processes found within the midstream sector. These include further processing the raw gas to remove impurities and by-products (e.g., ethane, propane, butane, condensate) or to prepare the gas for transportation and refining/distribution downstream.

* Video 1: [From Plant to Plant](https://www.youtube.com/watch?v=s9oMknya7Rg) (5 minutes, 54 seconds).

This animation shows how Woodside produces liquefied natural gas (LNG) for customers in the Asia-Pacific region and beyond.

5.3.3. Liquefied Natural Gas (LNG)

A brief explanation of how liquified natural gas (LNG) is created by chilling the natural gas to a temperature of about minus 162° C (minus 260° F) at atmospheric pressure. The section describes the characteristics of the LNG.

5.3.3.1. Video 2: [What is LNG? Turning Natural Gas into Liquid](http://www.youtube.com/watch?v=QgtSoEJD9HE) (02 minutes,   
48 seconds).

This video provides an excellent overview of the process used to convert natural gas into liquid natural gas or LNG.

5.3.3.2. Learning Activity 2 Energy Facts

Instructions

1. Ask students to work in small groups; watch Video 2 and then answer the questions below.
2. Allow the students to watch the video as many times as needed.
3. Have each group choose a person to write down the group’s answers.
4. Have each group select a spokesperson (different from the person who wrote down the group’s answers) to share the group’s findings with   
   the class.

Questions:

1. How much is global energy demand expected to increase by 2050?
2. What is the cleanest burning fossil fuel?
3. What is the purpose of converting natural gas to liquefied natural gas (LNG)?
4. What steps are taken in making liquefied natural gas (LNG)?
5. Name two heavier natural gas liquids that are separated from natural gas and sold separately or used as a refrigerant later in the cooling process?
6. What additional element is also filtered out?
7. What does purified natural gas contain?
8. What device is used to liquefy natural gas?
9. What temperature is natural gas cooled to?
10. How many times smaller is the volume of the gas after cooling   
    and liquefaction?
11. What does liquefied natural gas (LNG) look and smell like?
12. Is liquefied natural gas (LNG) toxic?
13. Where is liquefied natural gas (LNG) stored prior to shipping?
14. How is liquefied natural gas (LNG) transported?
15. What happens at a re-gasification plant?
16. How is the gas transported after re-gasification?
17. What is natural gas used for?

5.3.4. An Emerging Industry

This section describes the fact that liquified natural gas (LNG) is a newly emerging part of the natural gas industry to British Columbia, made possible by strong global demand for energy, advancements in technology, and the presence of very large natural gas reservoirs in the province.

5.3.4.1. The BC Government Vision

Describes the vision and strategy outlined by the Government of BC for natural gas and LNG since 2011.

5.3.4.2. Video 3 [Midstream Gas: Gas Processing, NGL and LNG Markets](http://www.ihrdc.com/els/po-demo/module14/mod_014_01.htm)   
(5 minutes, 59 seconds).

This video provides an excellent overview of the process within the midstream sector.

Note, to watch this video, open the URL listed above. Click on the green “video 1” icon located in the top left-hand corner of the webpage. The video will pause several times to allow discussion or questions. The video will continue when you click on the highlighted red box on each subsequent section.

5.3.5. Processing LNG

This section outlines the steps used to process natural gas to a liquified state (LNG), how it is stored, transported to markets and then converted back to vapour.

5.3.5.1. Video 4: [Liquefied Natural Gas (LNG) Value Chain](https://www.youtube.com/watch?v=rjlRTFyennU) (04 minutes,   
13 seconds).

This animation shows the value chain of liquified natural gas from extraction, treatment, liquification, transportation and regasification.

5.3.6. Active LNG Facilities in British Columbia

Provides a brief description of the two existing LNG facilities in the Lower Mainland and on Vancouver Island, BC.

5.3.7. Proposed LNG Projects in British Columbia

Lists the proposed LNG facilities planned for locations along the northwest coast and the south coastal areas of British Columbia.

* Website 1: [Invest in Northeast British Columbia – resources and video presentation](https://www.britishcolumbia.ca/invest/industry-sectors/natural-gas/).
* Website 2: [Explore BC’s LNG Projects](https://engage.gov.bc.ca/govtogetherbc/?s=LNG).

5.3.7.1. Learning Activity 3: How to Find Out About LNG Projects

This activity is designed to help students learn how to find information online about activities within the LNG sector, such as proposed LNG plants or facilities and associated potential employment and training opportunities.

Instructions

1. Ask students to work in small groups (or as a large group).
2. Have the students explore the companies listed in Table 1 by navigating to their websites; as well as Websites 1 and 2 to visit the provincial government website that contain further detailed information about LNG.
3. Have the students search for information to answer the questions:
   1. What information is available for these companies online?
   2. Do the companies listed offer training programs?
   3. Do they list job opportunities?
   4. Are there useful links to other sites?
   5. Where are the potential liquefied natural gas (LNG) projects that the companies are involved in?

5.3.8. Learning Activity 4 What Did You Learn About the Processes That Take Place in the Midstream Sector?

Instructions

1. Ask the students to re-watch videos 1, 2, and 3 and review the material in this section of the module.
2. Have the students retrieve the list they made in Learning Activity 1 and compare what they knew before with what they know now.
   1. Have the students note if they learned more about the industry than they knew?
   2. Have students note how accurate their understanding of what they thought they knew, compared to now?
3. Ask the students write down three new things that they learned from the videos, websites and material in the module.
4. Have the students share their learnings with a classmate or as part of a class discussion.

5.4. Transportation

5.4.1. Gas Pipelines

Provides information about the pipelines in BC and Canada used to gather and then transport natural gas to processing facilities.

5.4.2. Pipeline Considerations

This section outlines the numerous considerations that need to be addressed in building and operating pipelines to transport natural gas. These include the following:

5.4.2.1. Compressor Stations

Describes the need and use of compressor stations to keep natural gas moving in the pipelines.

5.4.2.2. Geopolitical

Overview of some of the specific conditions that must be satisfied by companies prior to building and while operating a pipeline.

5.4.2.3. Indigenous Consultation

Outlines the requirement that Indigenous peoples be consulted on project planning, development, monitoring, incident response, and general pipeline and environmental safety; and that *Free Prior and Informed Consent* be given by those impacted Indigenous communities.

5.4.2.4. Terrain and Weather

Overview of some of the terrain and weather factors that must be considered and mitigated when building a pipeline.

5.4.2.5. Maintenance

Outlines the critical importance of maintenance in ensuring the safe operation of a pipeline.

5.4.2.6. Video 5: [TransCanada – Pipeline Safety and Integrity – Inline Inspection](https://www.youtube.com/watch?v=yzOgWYNBwSA) (3 minutes, 59 seconds).

Video 5 highlights the tools and technology used to inspect natural gas pipelines.

Table 2 outlines the performance of BC pipelines per Km for 2018 as reported by the BC Oil & Gas Commission.

5.4.3. Trucking

Notes that natural gas can also be shipped by truck to service industrial, commercial and institutional customers.

5.4.4. Rail

Moving natural gas by rail is not currently an option. The technology is in its infancy and so far, tank cars are not permitted to carry fuel on Canadian railroads.

5.4.5. Marine Shipping

5.4.5.1. Compressed Natural Gas

Outlines the critical role marine transportation plays, using specially designed ocean-going ships. Also notes the use of specially built barges to transport compressed natural gas to small coastal communities and customer locations i.e. for filling stations for CNG-fueled vehicles.

5.4.5.2. Liquified Natural Gas

Outlines the critical role marine transportation plays in the movement of liquefied natural gas (LNG).

5.4.5.3. Video 6: [LNG Super Tanker Engineering Connections – BBC Documentary](https://www.youtube.com/watch?v=CkgCF64QLgg) (49 minutes, 38 seconds).

Video 6 with Richard Hammond from Top Gear is very informative and provides detailed insights about LNG supertankers and the natural gas industry.

5.4.5.3.1. Suggested Activity

Ask the students to make a note of any point that they find interesting or confusing or that answers one of the questions that they listed in Learning Activity 1. Challenge them to note 10 things by the end of the video.

5.4.6. Gas Storage

Outlines the four (4) types of facilities or systems used to store natural gas. Note, the use LNG tanks is further discussed in Module 2.5 Downstream.

5.4.6.1. Depleted Oil or Gas Fields

The most common storage facility used by industry.

5.4.6.2. Underground Saltwater Aquifer Reservoirs

Describes the use and challenges of using these reservoirs.

5.4.6.3. Salt Caverns

Describes how and when these types or reservoirs are used.

5.4.6.4. LNG Storage Tanks

Highlights the type of storage facility used to store liquified natural gas (LNG).

5.5. Midstream Companies and Jobs in British Columbia

5.5.1. Companies

Provides a list of some of the major companies operating in midstream sector of the natural gas industry in BC.

Note, every effort has been made to ensure this list is up to date at the time of printing. Instructors should check company websites to ensure names have not changed due to mergers or acquisitions that can happen without notice.

5.5.2. Occupations and Jobs

Provides a list of some of the common jobs found in the natural gas industry   
in BC.

5.5.3. LNG Jobs

Outlines the types of short-term and longer-term jobs expected in the LNG sector.

5.5.3.1. BC Provincial Government Job Estimates

Provides a synopsis of the estimated expected number of direct and indirect jobs to be created by the LNG sector during the construction and operational phases.

Note, the job numbers will change (up or down) depending on the number of LNG facilities proposed, the date of their approval, and when construction of the facility begins.

5.5.3.2. Video 7: [LNG Workforce](https://www.youtube.com/watch?v=leyMqJEvYR4) (02 minutes 38 seconds).

##### 5.5.3.3. For additional information on LNG, visit:

* Website 3: [Workforce Development](https://www.lngcanada.ca/opportunities/workforce-development/).
* Video 8: [Natural Gas in BC](http://www.youtube.com/watch?v=zZSGwQTuYuc) (02 minutes 38 seconds).

5.6. Learning Activity 5 Mad-Minute Midstream Learning

In learning activities 1 and 2, students looked at the knowledge they had about the midstream sector of the natural gas industry before reading all of the information in the module. This learning activity will help them show what they have learned now that they are fully informed.

Instructions

1. Ask students to select an aspect about the midstream sector that they did not know about before, but do now.
2. Have students summarize what they learned about their selection including noting anything that surprised them or that they feel is significant or interesting.
3. With a partner or as a class, ask students to share their new knowledge in a mad minute – a mad minute means they only have one minute to tell what they know.

5.7. Communities and LNG Projects

This section outlines the regions and communities within BC that are preparing for the coming development of LNG. Video 9 highlights some of the activities underway with LNG Canada and the Haisla Nation.

5.7.1. Video 9: [LNG Canada and the Haisla Nation - Working Towards Economic Growth](https://www.youtube.com/watch?v=avUywWJCYGg) (03 minutes, 50 seconds).

5.7.2. Learning Activity 6 Living in a Natural Gas or LNG Community in BC

This learning activity will help student get a feel for what it might be like to live in or near a community where natural gas is processed and/or where LNG plants are proposed.

Instructions

1. Ask students to use the information from Table 1 and Websites 1 and 2 to research communities in British Columbia close to natural gas and LNG operations or projects.
2. Students are to select a community and describe what life would be like in the community for a family moving there from a large city within or outside of the province.

The family consists of two parents (both of whom work outside the home) and two school-aged children (one in elementary school and one in high school). One parent has a natural gas/LNG related job; the other parent needs to find   
a job.

1. Have the students answer the questions below.
2. Where and what type of home might they have?
3. Are there schools for the children, and if so, where are they?
4. What kind of leisure activities are possible?
5. What community services are available e.g., medical, sports, recreation, etc.?
6. What is the housing availability and affordability?
7. Have the students share their findings with the class.

6. Suggested Reading

Encourage students to complete the suggested reading.

* Our Petroleum Challenge - Sustainability into the 21st Century, Eighth Edition, **Online PDF: Canadian Centre for Energy Information.**
* Section 2 - Inside the Industry.
* Chapter 5 – Transportation. pages 70-81.
* Chapter 7 – Marketing. pages 88-91.
* [BC LNG Alliance](https://canadianlnga.ca/).
* Oil and Gas Glossary and Definitions, Version 1.11: February 2019.
* [Online PDF: BC Oil and Gas Commission](https://www.bcogc.ca/files/publications/Factsheets/documentation-glossary-v111-feb-release-2019.pdf).
* NaturalGas.org [Processing Natural Gas](http://naturalgas.org/naturalgas/processing-ng/).
* American Gas Association, How Does the Natural Gas Delivery   
  System Work?

7. Notes

Lesson Plan: Module 2.5 – Downstream – Refining   
and Markets

1. Overview

This module provides information about the type of natural gas processing that happens in the downstream sector of the industry.

At the beginning of the class, let students know, that they will be doing a practical (hands-on) activity in the afternoon.

This module also introduces a ***Suggested Practical Activity*** for students. Instructors are strongly encouraged to engage students in this activity. A detailed outline of how to conduct the practical activity and the supplies required is included in [Appendix D](#_Appendix_D).

2. Learning Outcomes

When you complete this module, you will be able to:

1. Describe the two main components of the downstream natural gas sector in British Columbia.
   * Natural gas refining.
   * Distributing and marketing.
2. Name three refined natural gas products produced in the downstream sector.
   * Mostly used for generating electric or thermal energy. However, it can also be used to make fertilizers, fuel, paint, and many other items.
3. Describe the three largest users of natural gas in North America and what they use natural gas for.
   * Refined natural gas products > fuel for natural gas vehicles (NGVs).
   * Natural gas separation > paint, glue, vinegar, methanol, formaldehyde insulation, fuel additives, and acetic acid.
   * Mineral fertilizers > ammonia, nitric acid, ammonia nitrate, and carbamide.
4. Identify factors that influence the price of natural gas.
   1. The amount of supply and demand for natural gas.

3. Resources and Materials Required

1. Projector with audio.
2. Computers with internet connection; preferably one computer   
   per student.
3. Lesson Plan for WING Student Module 2.5.

4. Icebreaker

“I learned that courage was not the absence of fear, but the triumph over it. The brave man is not he who does not feel afraid, but he who conquers that fear.”

Nelson Mandela, President of South Africa

5. Summary of Sections and Learning Activities in the Module

5.1. Quick Review

5.1.1. Industry Sector Classification

Remind the class that Remember that in this program, we are using a three-sector classification system to describe the natural gas industry in British Columbia, though they may hear reference to just two-sectors: upstream and downstream.

5.2. Introduction

Highlights the two key areas of activity within the downstream sector of natural gas: gas refining and, distribution and marketing activities focused on customers.

5.2.1. Learning Activity 1 What Do You Know About the Processes Taking Place in the Downstream Sector?

*Instructions*

1. Before going further, have the class work with a partner and create a list of five (5) to ten (10) questions about the downstream sector that they hope to be able to answer by the end of this module.
2. Ensue students are as clear and detailed as possible about:
   1. What kind of processes are used at this stage?
   2. What types of jobs are in this sector?
3. Make sure they save this paper as it will be used later in this module.

5.3. The Downstream Sector

5.3.1. Refining

This section discusses the further refining of natural gas to extract key elements used in a wide variety of industrial, commercial and consumer products.

5.3.1.1. Refined Natural Gas Products

5.3.1.2. Fuel for Motor Vehicles – NGVs

Describes the use and advantages of natural gas as a motor fuel.

5.3.1.3. Natural Gas Separation

Describes the step and processes that take place at gas processing plants to separate valuable, recoverable elements from the natural gas, and to create usable industrial, commercial and consumer products.

5.3.1.4. Paint, Glue, and Vinegar

Describes how ethanol is produced from natural gas and turned refined products.

5.3.1.5. Mineral Fertilizers

Brief description on the creation of mineral fertilizers from natural gas.

5.3.1.6. Plastics

Brief outline of how natural gas is used to create plastics such as polyethylene and polypropylene, which are in turn used to create many of products we routinely use and need.

5.3.2. The Market for Natural Gas

The following sections outline the basics of the buying and selling of natural gas. Impress upon the students that this is a complex subject area, and that this section should be an entire course on its own. The following sections provides a very high-level overview only.

5.3.2.1. Consumers or Users

Provides information on the three main categories of natural gas users.

5.3.2.1.1. Residential Users

Provides general information and statistics on natural gas use by residential consumers.

5.3.2.1.2. Commercial and Industrial Users

Provides general information and statistics on natural gas use by commercial and industrial consumers.

5.3.2.1.3. Power Generation Users

Outlines the use and rapid growth of natural gas as a fuel for electrical power stations.

5.3.2.2. Demand

This section describes why demand for natural gas is rising and the factors influencing that demand.

5.3.2.3. Pricing

This section describes why prices for natural gas varies and the factors influencing those fluctuations.

5.3.2.3.1. Henry Hub Price

Describes how and where the standard price for natural gas (for markets within North America) is established.

5.3.2.3.2. For More Information About Pricing

Provides websites that students can research for additional information about pricing.

* Website 1: [NASDAQ Composite Index](http://www.nasdaq.com/markets/natural-gas.aspx).
* Website 2: [Alberta Natural Gas Prices](http://www.gasalberta.com/pricing-market.htm).
* Website 3: [Intercontinental Natural Gas Exchange (ICE NGX)](https://www.theice.com/ngx/overview).
* Website 4: [US Energy Information Administration FAQ](https://www.eia.gov/tools/faqs/faq.cfm?id=43&t=8).

5.3.3. Learning Activity 2 What Did You Learn About the Processes in the Downstream Sector?

Instructions

1. Have the students review the material in this section of the module.
2. Ask students to pair up with the student(s) they worked with in Learning Activity 1 and take out the list they made in Learning   
   Activity 1.
3. Have them compare what they knew before with what they know now.
   1. Did they learn more about what they thought they knew?
   2. How accurate was their understanding of what they thought they knew?
4. Ask the students to write down three new things that they learned from the websites and material in the module?
5. Ask the students to share their learnings with their partner.
6. Generate a class discussion of what they learned.

5.3.4. Practical Activity 1

Time permitting, ask the students to work on Practical Activity 1, outlined in [Appendix D](#Appendix_D). This exercise will allow them to demonstration their understanding of the key concepts within the upstream, midstream, and downstream sectors of the natural gas industry.

5.3.5. Companies

Provides a sampling of the major companies operating in the downstream sector of the natural gas industry in BC.

Note, every effort has been made to ensure this list is up to date at the time of printing. Instructors should check company websites to ensure names have not changed due to mergers or acquisitions that can happen without notice.

5.3.5.1. Occupations and Jobs

Provides a sampling of the common jobs found in the natural gas industry in BC.

* Website 5: [Canadian Gas Association (CGA)](http://www.cga.ca/suppliers-manufacturers/).

1. CGA represents major gas distribution and transmission companies and appliance and equipment manufacturers in Canada.

* Website 6: [Canadian Energy Pipeline Association (CEPA)](https://cepa.com/en/cepa-members/).

1. CEPA represents firms in the transmission pipeline industry in Canada.

5.3.5.1.1. Learning Activity 3 Identifying Downstream Sector   
Employers of Interest

Instructions:

1. Ask students to make a list of employers in the downstream sector of the natural gas industry that they might be interested in working for.
2. Have students gather company names for their list by visiting websites 5 and 6.
3. List of the various distributors, transmission, and equipment supply firms operating in the downstream sector.

5.4. New Vocabulary

5.4.1. Learning Activity 4 Learning New Vocabulary

1. Review the list of New Vocabulary in the student module (also shown below), with students.
2. Ask students to write short descriptions for each term listed, on their own, and be prepared to discuss them the next day.

5.4.1.1. Terms and Definitions

Dry Gas

* Gas produced from a well that produces little or no [condensate](https://www.glossary.oilfield.slb.com/Terms/c/condensate.aspx) or [reservoir](https://www.glossary.oilfield.slb.com/Terms/r/reservoir.aspx) liquids. The [production](https://www.glossary.oilfield.slb.com/Terms/p/production.aspx) of liquids from gas wells complicates the design and operation of surface process facilities required to handle and export the produced gas.

Wet Gas

* [Natural gas](https://www.glossary.oilfield.slb.com/Terms/n/natural_gas.aspx) containing significant heavy hydrocarbons. Propane, butane and other [liquid hydrocarbons](https://www.glossary.oilfield.slb.com/Terms/l/liquid_hydrocarbons.aspx) can be liquefied.

Sour Gas

* A gas containing [hydrogen sulphide](https://www.glossary.oilfield.slb.com/Terms/h/hydrogen_sulfide.aspx), [carbon dioxide](https://www.glossary.oilfield.slb.com/Terms/c/carbon_dioxide.aspx) or mercaptans, all of which are extremely harmful.

Natural Gas Liquids (NGL)

* Liquids obtained during natural gas production, including ethane, propane, butanes and condensate.

Liquefied Natural Gas (LNG)

* Natural gas, when produced and used domestically, is shipped in its vapour form through a network of distribution pipelines to a local distribution company and then delivered to a customer. When natural gas is shipped to a distant foreign market outside of where it is produced, the natural gas needs to ‘shrink in size’ or be compressed in order to ship large volumes economically – this liquefies the natural gas (LNG). The ‘shrinking’ of natural gas reduces its volume by a factor of about 600.

Liquid Petroleum Gas (LPG)

* Is mainly composed of propane and butane, which has been liquefied at low temperatures and moderate pressures. The gas is obtainable from refinery gases or after the [cracking](https://www.glossary.oilfield.slb.com/Terms/c/cracking.aspx) process of crude oil. Liquefied [petroleum](https://www.glossary.oilfield.slb.com/Terms/p/petroleum.aspx) gas is also called bottle gas. At atmospheric [pressure](https://www.glossary.oilfield.slb.com/Terms/p/pressure.aspx), it is easily converted into gas and can be used industrially or domestically.

Natural Gas Vehicle (NGV)

* An alternative fuel vehicle that uses compressed natural gas (CNG) or liquefied natural gas (LNG).

Compressor Station

* A compressor station is a facility used to compress natural gas using compressors and other equipment in order to create additional pressure to increase the amount of gas a pipeline can hold over long distances.

Dehydration

* The removal of water from natural gas by lowering the dew point temperature of the natural gas.

Cryogenics

* Cryogenic separation is a processing operation that is commonly used to extract natural gas liquids (NGLs) from raw natural gas used to separate out lighter hydrocarbons such as ethane, propane, and butane.

Gas to Liquid (GTL)

* Technology that converts natural gas liquid products that would otherwise be made from crude oil to create products that include transport fuels, motor oils and the ingredients for everyday necessities like plastics, detergents and cosmetics. GTL products are colourless and odourless, containing almost none of the impurities (sulphur, aromatics and nitrogen) found in crude oil.

Gas Processing Plant (GPP)

* A facility designed for cleaning raw natural gas by isolating several non-methane fluids and hydrocarbons and other impurities to produce dry natural gas of pipeline quality. Natural gas processing is a complicated industrial process that initiates at the wellhead.

6. Suggested Reading

* Our Petroleum Challenge - Sustainability into the 21st Century, Eighth Edition, Online PDF Version, Canadian Centre for Energy Information.
* Section 2 - Inside the Industry.
* Chapter 6 – Refining. pages 82-87.
* Section 3 - Sustainable Development.
* Chapter 1 – Sustainability. pages 94-99.
* [Building Trust: Canadian LNG Developers and First Nations. Canada and the Natural Gas Economy Special Report 3](https://s3.amazonaws.com/media.dailyoilbulletin.com/pdf/LNG-Special+Report-February+2020_FINAL.pdf), **3 Feb. 2020.**

7. Notes

Lesson Plan: Module 2.6 Health and Wellness

1. Overview

This module provides information about personal health and wellness and its impact on your performance at work. This information is important to understand before moving onto the work in Module 2.7 Safety. Workers in the natural gas industry must always be healthy and alert.

2. Learning Outcomes

*When you complete this module, you will be able to:*

1. Understand how health and wellness is different from safety.
2. Describe how health and wellness can affect safety.
3. Describe the various factors of health and wellness.
4. Describe indicators of poor health and wellness.
5. Understand how diversity and inclusion impact health and wellness.
6. Understand how a respectful workplace improves health and wellness.
7. Create a personal wellness plan.

3. Required Materials and Resources

1. Projector with audio.
2. Computers with internet connection; preferably one computer   
   per student.
3. Lesson Plan for WING Student Module 2.6.

4. Icebreaker

“Live your life that the fear of death can never enter your heart.

Trouble no one about his religion.

Respect others in their views and demand that they respect yours.

Love your life, perfect your life, and beautify all things in your life.

Seek to make your life long and be of service to your people.

Always give a word or sign of salute when meeting or passing a friend, or even a stranger, if in a lonely place.

Show respect to all people but grovel to none.

When you rise in the morning, give thanks for the light, for your life, and for your strength.

Give thanks for your food and for the joy of living.

If you see no reason to give thanks, the fault lies in yourself.

When your time comes to die, be not like those whose hearts are filled with fear of death, so that when their time comes, they weep and pray for a little more time to live their lives over again in a different way.

Sing your death song and die like a hero going home.”

Tecumseh, Shawnee (1768-1813)

5. Summary of Sections and Learning Activities in the Module

5.1. Health and Wellness in the Natural Gas Industry

This section discusses the importance of health and wellness of the workforce to the natural gas industry. It then describes the many facets and dimensions of personal wellness.

5.2. Respectful Workplace

This section outlines the importance of maintaining a respectful workplace   
for all workers and the requirement to avoid all forms of harassment and discrimination. It also lists the minimum standards of behaviour required to maintain a respectful workplace.

5.3. Diversity and Inclusion

This section speaks to the need to recognize, understand and accept that the people are all different. It speaks to visible differences such as age, gender, ethnicity and physical appearance, as well as underlying differences such as thinking styles, religion, nationality, sexual orientation and education. Defines what inclusion and diversity mean (creating a working culture where differences are valued; where everyone has the opportunity to develop skills and talents consistent with societal values and our employer’s business objectives).

5.4. Everyday Steps to Health and Wellness

Outlines some simple steps students can take to protect their health   
and wellness.

5.4.1. Learning Activity 1 Talking About Health and Wellness

The purpose of this learning activity is to have students discuss the topic of health and wellness in a supportive environment. The discussion is not a debate; there are no specific points that need to be made.

Instructions

1. Hold a class discussion about health and wellness.
2. Focus discussion around what students think are the most important elements of health and wellness for themselves, their families, and the community.
3. Encourage students to bring up issues they feel are important to the topic and talk about them.
4. Facilitate the discussion so no reasonable issues are dismissed as being unimportant. Remind then this is not a debate.
5. Be sure to talk about zero tolerance policies in the industry regarding drugs and alcohol.
6. Discussion should focus around the following questions.
7. What do you think are the most important elements of health and wellness for you? For your family and friends? For your community?
8. How does pride in your history or ancestry and sharing your stories contribute to your health and wellness?
9. How can sharing stories contribute to the health and wellness of a community? A work team?

5.5. Health and Wellness Trends in the Natural Gas Industry

This section outlines the major trends and resources leading companies in the natural gas industry offer their employees. Highlight the fact that the industry operates under strict government regulations and health and safety standards.

5.5.1. Learning Activity 2 Creating a Personal Wellness Plan

Instructions

* 1. Have the students work individually on this exercise.
  2. Explain that a wellness plan is simply a series of steps or actions, which if followed, will help the student to be and stay healthy.
  3. Ask students to:
  4. Step 1: Have students assess their wellness.
  5. Review the elements outlined in the graphic box of this learning activity and assess the amount of wellness, or fulfillment, they feel they have in each area.
  6. Step 2: Identify areas that could use improvement.

1. Set their own goals for each area, especially those that they have identified as needing improvement.
   1. Step 3: Set goals related to improvements the student wants to make.
   2. List the things they can do to help them accomplish each of their goals.
2. Note: **Step 4: Record your progress** and **Step 5: Update the goals of your wellness plan as needed** are to be done on the students’ own time so they can put their plan into action.

5.6 Family Wellness

This section discusses the health needs and requirements of the family members of those working directly in the natural gas industry. An important part of the health and wellness programs offered by the natural gas industry includes helping the families of the workers to be happy and healthy. The industry understands that strains on the family can lead to workers being distracted, which in turn creates a potentially dangerous work environment.

5.6.1. Learning Activity 3 Explore Your Own Health and Wellness

5.6.2. Website 1 [Working Strategies for Mental Health](https://www.workplacestrategiesformentalhealth.com/self-assessment-tools).

Instructions

1. Have the students visit the website and explore the tools that are available to them to evaluate their own mental health.
2. Have them try out some of the tools.

5.7. When Things Go Wrong

This section highlights some additional resources that the major firms offer   
to their employees if they or their family members are not able to cope on   
their own.

5.7.1. Learning Activity 4 Employee Assistance Programs (EAPs)

Instructions

* 1. Have students research websites and organizations that provide information about Employee Assistance Programs (EAPs) in BC.

6. Suggested Reading

* Website 1: [Ministry of Health – Healthy Work Environment.](http://www.health.gov.bc.ca/environments/workplace/)
* A great resource. Be sure to check out the sub-sections listed in the column on the left-hand side.
* Website 2: [Canadian Mental Health Association – Work-Life Balance Quiz](http://www.cmha.ca/mental_health/work-life-balance-quiz/" \l ".VE1L1GfCc8B).
* Scroll down the page to view the on-line test. A great information resource for helping you find and maintain a proper work-life balance.
* Website 3: [Here to Help – Wellness Modules](http://www.heretohelp.bc.ca/wellness-modules).
* Excellent resource to go to for people to learn and to get help for themselves or a loved one in a time of crisis.
* Website 4: [Diversity and Inclusion](https://www.ceridian.com/ca/blog/six-ways-to-support-diversity-and-inclusion-in-the-workplace).
* A good summary on why diversity and inclusion are important in the workplace and measure’s employers are taking to enhance it.
* Website 5: [Respectful Workplace](https://www2.gov.bc.ca/gov/content/careers-myhr/all-employees/working-with-others/address-issue).
* This BC government website provides good reference materials and examples to create and maintain a respectful workplace.
* Website 6: [First Nations Health Authority](https://www.fnha.ca/wellness/wellness-and-the-first-nations-health-authority).
* The First Nations Health Authority is a Health & Wellness partner to every First Nations person living in BC.

7. Notes

Lesson Plan: Module 2.7 Safety

1. Overview

This module provides information about safety and its critical importance in the natural gas industry for workers, communities and the environment. Students will learn about two kinds of safety—personal and process—as well as about how safety is a shared responsibility between the worker, their employer, and everyone who steps on a job site.

2. Learning Outcomes

*When you complete this module, you will be able to:*

1. Understand and explain the importance of personal safety in the natural gas industry.
2. Identify and describe employer responsibilities for occupational health and safety in British Columbia.
3. Understand the purpose of safety meetings and complete a safety meeting checklist.
4. Describe what a Job Hazard Assessment is and complete one.
5. Identify and describe government legislation and standards for occupational health and safety in British Columbia.
6. Explain the difference between personal safety and process safety.
7. Describe the role of health and wellness in safety processes.

3. Required Resources and Materials

1. Projector with audio.
2. PowerPoint Presentation.
3. Computers with internet connection; preferably one computer   
   per student.
4. Lesson Plan for WING Student Module 2.7.

4. Icebreaker

" I attribute my success to this: I never gave or took any excuse."

Florence Nightingale, Founder of Modern Nursing

5. Summary of Sections and Learning Activities in the Module

5.1 Review

Review the suggested reading from Module 2.6 with students.

5.2 Introduction

This module outlines the critical importance that safety plays in the natural gas industry, and that safety is everyone’s number one responsibility. The purpose of this module is not to scare students; but to make them acutely aware of the risks inherent in the industry, and how they can be managed or mitigated, so workers and others can safely complete their job.

Emphasize that completing this module is in no way intended as a substitute for specific safety training and certification required to work in this industry.

5.3 Personal Safety

5.3.1. It Starts With YOU

This section highlights that safety is a shared responsibility between a worker, their employer, and everyone else working at a worksite. Emphasize that the employer has a legal responsibility to train every employee to ensure their overall safety; but safety really starts and stops with the choices, decisions, and actions that the student, as a person and a worker makes.

As a worker in the natural gas industry, the students need to understand that they must take personal responsibility for their safety.

* Video 1: [New and Young Workers](https://www.youtube.com/watch?v=2XH1s518xoA) (5 minutes, 38 seconds).
* Video 2: [Lost Youth – Four stories of injured young workers](https://www.worksafebc.com/en/resources/health-safety/videos/lost-youth-four-stories-of-injured-young-workers/full-version?lang=en)   
  (17 minutes, 44 seconds).
* Video 3: [2020 POST Safety Forum – Mental Health in the Workplace](https://www.youtube.com/watch?time_continue=779&v=W3XGahZ1Ezc&feature=emb_logo)   
  (31 minutes, 50 seconds).

5.3.1.1. Learning Activity 1 Taking Personal Responsibility

This learning activity involves students understanding the importance of taking personal responsibility, and the impacts mental health issues can have on personal and team safety.

Instructions

1. Have the students watch Videos 1, 2 and 3.
2. Break the class into small groups and have the students discuss what mental health issues might have been root causes of the incidents in Video 2.
3. Ask each group to choose a person to write down their ideas. Choose a different person to share the ideas with the class.
4. Working again in their small groups, answer the following questions:
   1. What are the four states that cause 90% of all workplace injuries?
   2. What is absenteeism and presenteeism? How do they affect safety?
   3. What kinds of behaviours should workers, co-workers and employers be aware of that might indicate that someone is experiencing mental distress and is not fit for work?

5.3.3. Safety: A Responsibility Shared with Your Employer

This section outlines that personal safety is very much a shared responsibility with the employer. It outlines the employers’ legal responsibility to ensure minimum safety requirements - set by the government are present and followed in every workplace.

* Video 4: [Safety is Personal, An Employer’s Story](https://www.worksafebc.com/en/resources/health-safety/videos/safety-is-personal) (7 minutes,   
  11 seconds).

5.3.3.1. Refusing Unsafe Work**[[2]](#footnote-3)**

This section discusses the right that workers have to refuse unsafe work, if they have reasonable cause to believe that performing a job or task puts them or someone else at risk. It then outlines the procedure and steps required when a worker believes they are about to undertake unsafe tasks or enter unsafe working conditions.

5.3.3.2. Your Employer’s Safety Policies and Practices

The section outlines employers’ responsibilities for informing, training, and regularly updating all employees about how to complete their job duties safely and in compliance with relevant health, safety and environmental legislation and regulations.

**5.3.3.3. Orientation and Training**

Outlines the general steps of an employee orientation and types of approaches to training.

**5.3.3.4. Occupational Health and Safety Officers**

A basic outline of the role of an Occupational Health and Safety Officer, and the use and purpose of a safety handbook or manual.

**5.3.3.5. Safety Meetings**

Outlines the purpose and use of safety meetings, including toolbox or tailgate meetings. Introduces the concept and use of Safety Meeting and Hazard Checklists.

**5.3.3.5. Job Safety Analysis (JSA)**

Introduces students to Job Hazard Assessments worksheet that captures information and risks about how to complete a specific job task.

A sample Safety Analysis Assessment is shown in the student manual. Extra “Safety Meeting and Hazard Checklist” forms are located at the end of the Student module in **Appendix A**.

5.3.4. Workplace Violence

This section outlines the employers’ responsibility to ensure workers’ physical safety. Employers are responsible for providing an environment that is safe from bullying, physical, and non-physical violence.

5.3.4.1. Video 5: [Bullying in the Workplace](https://www.youtube.com/watch?time_continue=210&v=u7e2c6v1oDs&feature=emb_logo) (04 minutes, 06 seconds).

This short video explains workplace bullying and harassment and the legal duties in B.C. for workers, employers, and supervisors.

5.3.4.2. Video 6: [Lateral Violence](https://www.youtube.com/watch?v=neWtt3sAqMM) (19 minutes, 57 seconds).

This video explores the core issues of lateral violence explored within a First Nations perspective.

5.3.4.3. Learning Activity 2 Workplace bullying and lateral violence

The exercise is intended to assist students to better identify various forms of bullying and workplace harassment and understand the impacts of workplace bullying on themselves and their co-workers.

Instructions

1. Have students consider their own experience with these two issues, and write down what they have witnessed, participated in, or been affected by either of these behaviors.
2. Break the students into small groups and have them discuss 2-3 strategies for dealing with or managing these complicated situations.

5.3.4.4. Learning Activity 3 Holding a Safety Meeting

This activity involves students holding a safety meeting and completing a Safety Meeting and Hazard Checklist. Forms for the Checklist are found at the end of the student module.

Instructions

1. Have the students watch videos 1, 2, and 3.
2. Hold a safety meeting with the class to model how to lead a safety meeting.
3. Divide students into small groups.
4. Ask each group to appoint one person to be the Supervisor; the other others can be employees.
5. Working in their groups, have students take turns being the Supervisor and leading a safety meeting, using the Safety Meeting and Hazard Checklist form in **Appendix A** of the module.

5.3.4.5. Learning Activity 4 Completing a Job Safety Analysis (JSA)

This learning activity involves students becoming familiar with conducting safety assessments at work sites. Students can use the Job Safety Analysis forms at the end of the student module to record their results.

Instructions

1. Break students into small groups.
2. Have each group select and assess a different area of the building   
   where the training is taking place and assess it for hazards.
3. Encourage students to focus on using legible hand-writing and clear communication.
4. Discuss findings as a class.

5.3.5. Safety Legislation and Legal Framework

The section outlines the role of WorkSafeBC in establishing minimum health and safety standards, and its responsibility of enforcing those standards. Note that the natural gas industry frequently has requirements that go beyond those minimum standards set by WorkSafeBC.

5.3.5.1. WorkSafeBC

* Website 1: [WorkSafeBC](https://www.worksafebc.com/en/resources/health-safety/videos/safety-is-personal).

5.3.5.1.1. Key documents on WorkSafeBC’s website

There are five key documents workers and employers need to be aware of to understand and meet WorkSafeBC minimum requirements.

1. [Workers Compensation Act](https://www.worksafebc.com/en/law-policy/occupational-health-safety/searchable-ohs-regulation/workers-compensation-act/workers-compensation-act) (WCA) explains the rights and responsibilities of employers and workers with respect to health and safety.
   1. Check out [Part 3 Occupational Health and Safety](https://www.worksafebc.com/en/law-policy/occupational-health-safety/searchable-ohs-regulation/ohs-regulation/part-03-rights-and-responsibilities).
   2. Scroll down to Division 3 and you will see the specific requirements for all employers, workers, supervisors, suppliers, and others.
2. [Hazardous Products Act](https://laws-lois.justice.gc.ca/eng/acts/h-3/)(HPA) (Canada) defines which materials are included in the WHMIS (Workplace Hazardous Materials Information System) and what information suppliers must provide to employers for controlled products used in the workplace.
3. [Occupational Health and Safety (OHS) Regulation](https://www.worksafebc.com/en/law-policy/occupational-health-safety/occupational-health-safety-regulation) contains the specific legal requirements that must be met by all workplaces under the inspection jurisdiction of WorkSafeBC.
4. [Prevention Manual](https://www.worksafebc.com/en/resources/law-policy/prevention-manual/prevention-manual?lang=en) (policies) contains WorkSafeBC policy with respect to matters under Part 3 of the WCA and the Occupational Health and Safety Regulation.
5. [OHS Guidelines](https://www.worksafebc.com/en/law-policy/occupational-health-safety/ohs-guidelines) help interpret and provide ways to comply with OHS Regulation and the WCA.

Check out WorkSafeBC’s safety information and links specific to the [oil and gas](https://www.worksafebc.com/en/health-safety/industries/oil-gas) industry.

5.3.5.2. Other sources of information about safety

* Website 2: [OHS Canada](http://www.ohscanada.com/).
* Canada’s online occupational health and safety magazine.
* Website 3: [Canadian Centre for Occupational Health and Safety](http://www.ccohs.ca).
* Tools and resources to improve workplace health and safety programs.
* Website 4: [Energy Safety Canada](http://www.energysafetycanada.com/).
* A national oil and gas safety association whose goals include zero   
  injuries and zero incidents. The association works side-by-side   
  with industry to drive safe work performance and to get workers   
  home safely.

5.3.5.3. Learning Activity 5 Creating Your Own Personal Safety Contract

In this activity, students make something that can serve as a daily reminder of the importance of working safely. It involves each student writing a contract with himself or herself to always work safely, regardless of the company, industry, or environment that they work in. A sample personal safety contract is shown for reference on Form 3 of the student module; a copy is included in this Guide on the following page.

Instructions

1. Ask students to write a safety contract for themselves.
2. Their contract should be professional, sincere and plausible.
3. Encourage students to reflect on the information in the videos and what they learned during their safety ticket training.

### My Personal Safety Contract

I, Betty Smith promise to follow these steps to personal workplace safety so that I may always return home to my family at the end of each day.

I promise to:

* Attend safety meetings before my shift begins.
* Arrive at work with all of my safety equipment in good working order.
* Wear my steel toed boots everyday whenever I’m on the job.
* Use my eye protection, ear protection and other personal protective equipment EVEN WHEN my co-workers may not.
* Immediately report any and all potentially dangerous or hazardous conditions to my supervisor(s).
* Take scheduled breaks, so that I do not become overtired or inattentive.
* Not drink alcohol, recreational drugs or take any medicines that may make me less alert before or during my shift.
* Refuse to do work that is unsafe.
* Take on a task that I do not feel trained to do.
* Not attend work if I am sick and unfit for work.

Betty Smith

### Your Signature Here

5.4. Process Safety

5.4.1. What is process safety?

This section highlights the difference between Process Safety and Personal Safety. Both are critically important in the natural gas industry. While definitions vary, one simple way to think of the difference is:

* **Personal safety** is focused on keeping **people** safe in the workplace
* **Process safety** is focused on the integrity of the **industrial processes**.

5.4.2. Resources about process safety included in the student module.

* PowerPoint Presentation 1: [Process Safety vs Personal Safety](https://www.slideshare.net/EnformSafety/enform-oil-and-gas-safety-personal-safety-v).
* This online PowerPoint slide show was developed by Enform, the Safety Association for Canada’s Upstream Oil & Gas Industry. It presents the differences between personal safety and process safety.
* Video 7: [Committed to Safety: Learning together as leaders in the oil and gas industry](https://www.youtube.com/watch?v=n0DwGXV-cEA) (04 minutes, 12 seconds).
* Video 8: [Stupidity at The Workplace – (Bad & funny habits on the job - death and injury factors at work)](https://www.youtube.com/watch?v=UeB7l_O8T6o) (03 minutes, 30 seconds).
* Video 9: [CSB Safety Video: Anatomy of a Disaster](https://www.youtube.com/watch?v=XuJtdQOU_Z4&list=PLFD85FBF79CD6D1AA) (55 mins, 33 secs).
* This video highlights the importance of process safety by telling the story of one of the worst industrial accidents in recent U.S. history – the March 23, 2005 explosion at the BP Refinery in Texas City, Texas which killed 15 workers and injured 180 others.
* Video 10: [Animation of Fire at Chevron's Richmond Refinery, August 6, 2012](https://www.youtube.com/watch?v=QiILbGbk8Qk) (08 minutes, 14 seconds).
* Video 11:  [Blowout in Oklahoma, January 22, 2018](https://www.youtube.com/watch?v=1zDcsjHyxr8)   
  (21 minutes, 19 seconds).

5.4.3. Learning Activity 6 Process and Personal Safety News Report

This learning activity helps students become more familiar with different aspects of process and personal safety. Students work in groups to prepare and present a news report on a specific topic relevant to process or personal safety.

Instructions

1. Divide the class into two groups.
2. Have each group select a safety topic that was discussed in the PowerPoint Presentation 1 or videos 7, 8, 9, 10 and 11, or the group can choose another safety topic that they think is important.
3. Instruct each group to create a news report on their selected safety topic for presentation to the class.
4. Encourage students to use information from the PowerPoint Presentation and watching videos 7, 8, 9, 10 and 11 in their reports.
5. Reports should be approximately 7 -10 minutes in length.
6. Allow 20-30 minutes for groups to prepare the presentation.
7. Ask the groups to select a “reporter”, to present their news report to   
   the class.

5.5. Safety Companies and Jobs

5.5.1. Companies

Provides a sample list of some of the firms supplying safety services to the natural gas industry. Have the students explore these links and search for other firms.

* Website 5: [Action Health and Safety Services](http://actionservices.ca/).
* Website 6: [Energy Safety Canada](https://www.energysafetycanada.com/).
* Website 7: [MC Rehabilitation and Wellness](http://mcrehabandwellness.com/).
* Website 8: [St. John Ambulance](http://www.sja.ca/English/Pages/default.aspx).
* Website 9: [Trojan Safety Services Ltd](http://www.trojansafety.com/content/services).

5.5.2. Occupations and Jobs

Lists examples of specific safety related jobs that students might be interested in exploring.

6. Suggested Reading

* [WorkSafe BC:](https://www.worksafebc.com/en/health-safety/create-manage/enhancing-culture-performance) [Enhancing health & safety culture & performance](https://www.worksafebc.com/en/health-safety/create-manage/enhancing-culture-performance).

7. Notes

Lesson Plan: Module 2.8 Terminology and Communication

1. Overview

This module provides information about common terminology and communication in the natural gas industry. Learning activities include some fun tools for remembering industry-specific terms which students may not be familiar with (e.g., roughneck, spudding, payzone, etc.) and exercises to help students practice effective communication skills (e.g., active listening and speaking). The goal of the module is to prepare students to communicate effectively with employers and on job sites in the natural gas industry.

2. Learning Outcomes

*When you complete this module, you will be able to:*

1. Recognize terminology specific to the oil and gas industry.
2. Understand what effective communication is.
3. Use basic effective listening and speaking skills when communicating with employers and working on job sites in the natural gas industry.

3. Required Materials and Resources

1. Projector with audio.
2. Computers with internet connection; preferably one computer   
   per student.
3. Lesson Plan for WING Student Module 2.8.

4. Icebreaker

" Wisdom is not a product of schooling but a lifelong attempt to acquire it."

Albert Einstein

5. Summary of Sections and Learning Activities in the Module

5.1. Terminology

The module provides an overview of the common terms, phrases and words uses in the natural gas industry. Some words may be the same as used in other industries but have quite different meanings in the natural gas industry.

5.2. Learning Activity 1 [Energy IQ Glossary of Oil and Gas Terms](https://energyiq.canadiangeographic.ca/main/glossary)

Instructions

This learning activity, as well as the next two, are fun ways to help students learn and remember some of the new terminology they have encountered while learning about the industry.

*In Learning Activity 1*, students use the Energy Glossary at the Energy IQ website (website link above) to find words and their meaning.

1. The Energy IQ Glossary lists words in 3 columns.
2. Assign each student one word from each column, for a total of three words per student.
3. Ask students to click on the words they were assigned, to find the meaning and then write the meaning on a piece of paper; encourage students to consult one or more of the glossaries for definitions.
4. Once all students have finished, have students take turns reading out their words and meanings.
5. Encourage students to refer to this and the other great glossaries shown below whenever they come across an unfamiliar word.

5.3. Additional Glossaries to Recommend

* Website 1: [Schlumberger Comprehensive Glossary](https://www.glossary.oilfield.slb.com/Terms.aspx?filter=m&LookIn=term%2520name&searchtype=starts%2520with).
* Website 2: [Canadian Association of Petroleum Producers Glossary](https://www.capp.ca/resources/glossary/).
* Website 3: [Conoco Philips Glossary](https://static.conocophillips.com/files/resources/conocophillips-glossary-of-terms-external-final-6-.pdf).

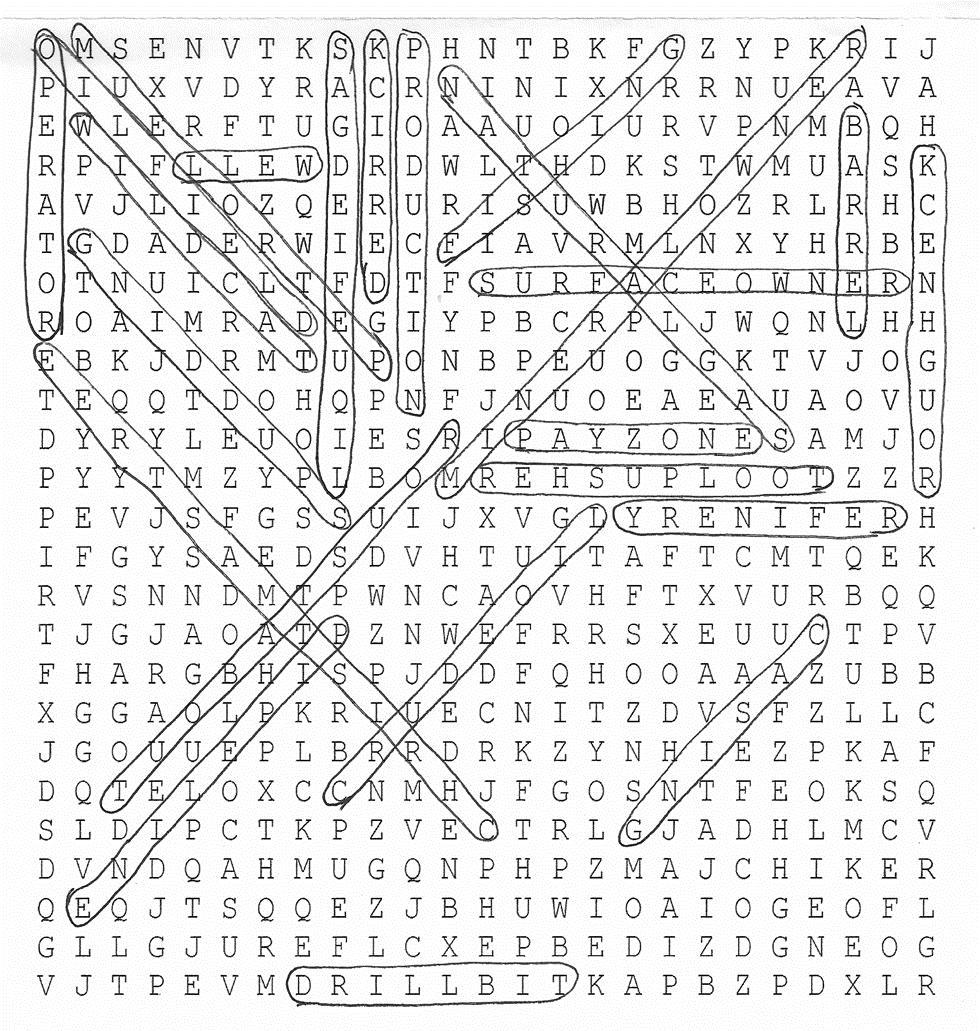
5.4. Learning Activity 2 Oil and Gas Word Search

This learning activity involves having students complete a find-a-word puzzle with common industry terms, and then find the definitions for each of the words.

Instructions

1. Have students work in pairs.
2. Ask students to find the hidden words in Figure 1: Oil and Gas Word Search. Remind them that the words can be written horizontally, vertically, or diagonally. Some may even be written backwards!
3. Allow up to 30 minutes to complete the puzzle.
4. Once everyone is finished, have students look up each of the words found and write a short definition for each word in the space provided.
   1. Encourage students to use the Energy IQ glossary as well as the other the other glossaries.
5. As a class, discuss any words that students are unable to define or are still uncertain about.

The answers for the Word Search and definitions for the words are in   
Appendix A of the student module, and included below for reference.

5.4.1. Oil and Gas Word Puzzle – Answer Key

5.4.2. Oil and Gas Word Definitions – Answer Key

Barrel: Unit of measurement of oil

1 barrel = 159 litres or 42 US gallons.

Casing: Pipe cemented in the wall to keep the hold from caving in.

Christmas Tree: Knobs and valves that control the rate of flow from a well.

Crude Oil: Smelly yellow-to-black liquid as it comes out of the ground.

Derrick: A frame tower that supports drilling equipment.

Drill Bit: The piece of drilling equipment that rotates to break up rock and soil.

Fishing: Finding and picking up equipment accidentally dropped in a well.

Liquefied Natural Formed when natural gas is cooled to -162°C at a

Gas: specialized refinery.

Mineral Owner: The person who owns the rights to any oil, gas or other minerals in the ground; they have the right to drill through the surface even if someone else owns the surface.

Natural Gas: Odourless, colorless, non-solid and non-liquefied, clean burning fossil fuel; public service companies add a bad odour to it to make leaks easier to detect.

Oil Field: A geographic area under which oil lies.

Operator: A company responsible for drilling or running and maintaining a well.

Payzone Rock where oil and gas are found for production

Petroleum: General name for crude oil, liquefied gas, natural gas and other products.

Pipeline: A system of pipes for transporting oil and gas.

Production: The lifting of oil and gas to the surface for gathering, processing and storing it.

Refinery: An industrial plant that heats crude oil so that it separates into chemical components which are then made into other products.

Roughneck: The member of the drilling crew who puts together and takes apart the drill pipe.

Roustabout: The member of the drilling crew who loads and unloads equipment and helps with general operations.

Spudding: Drilling the first part of a well.

Surface Owner: The person who owns the land above-ground; they have to let the mineral owner drill through the surface to get to the minerals.

Toolpusher: Second in command of a drilling crew (first in command is the Superintendent).

Well: A hole drilled in the earth in order to find and produce crude oil or natural gas.

Wildcat: A well drilled in an area with no other wells in order to explore if oil and gas are present in the area.

5.5. Learning Activity 3 Word Association

This activity should get some laughs in the room and is an excellent tool for helping students remember long lists of words, e.g., like the ones from the Energy IQ Glossary (Learning Activity 1) or, the Oil and Gas Word Search (Learning Activity 2). The activity can be conducted as a class or in groups; it can also be done “Pictionary” style with students drawing the word if you have a keen group.

Instructions

1. Select a student or ask for a volunteer.
2. Have the students choose (or assign them) a word from either the Glossary or the Puzzle; some great choices could be:
   1. Spudding.
   2. Royalty.
   3. Transformer.
3. Instruct the student to say the word aloud, to activate their auditory (hearing) memory.
4. Then ask students to associate the word with words they already know, i.e., pair them with similar words, identify examples that signify the word, visualize the word in combination with a strong emotion, etc.
   1. Associations should suit the meaning of the word as it relates to the natural gas industry.
5. Example: GARGANTUAN, meaning very large.
   1. Use it in a sequence of words -- small, medium, large, very large, GARGANTUAN.
   2. Make a list of things that are GARGANTUAN -- a blue whale, a mammoth, Godzilla.
   3. Visualize it in a scary way – “the GARGANTUAN creature is going to rip me apart and then eat me!"
6. Have everyone in the class take turns sharing their word and the associations they made for it; or repeat the process as many times as you wish (usually a popular game) or until you have exhausted the list of words.

5.6. Communication

5.6.1. Types of Communication

This section outlines the critical importance of clear communications (both sending and receiving) for those working in the natural gas industry. Touches on the three main types of communications.

5.6.1.1. Verbal Communication

* Video 1: [The Two Ronnies – Four Candles](https://www.youtube.com/watch?v=gi_6SaqVQSw) (06 minutes, 45 seconds).

5.6.1.2. Written Communication

This section speaks to the importance of written communication in the natural gas industry.; including such items as policies and procedures, minutes of meetings, safety reports, instructions, etc. Highlights the requirement for all communications be professional and use non-discriminatory language.

5.6.1.2. Non-Verbal and Body Language

This section highlights how these two types of communications can carry significant meaning, but also create misunderstandings and possible conflict.

* Video 2: [A Failure to Communicate](https://www.youtube.com/watch?v=8Ox5LhIJSBE) (02 minutes, 28 seconds).
* Video 3: [Funny Dancing Traffic Cop](https://www.youtube.com/watch?v=u6WFccH2fZM) (01 minute, 52 seconds).

5.6.2. Learning Activity 4 Communicating Clearly

This activity will help students realize the importance of clear communication and the problems that can result from ineffective communication, whether verbal, written, or non-verbal/body language.

Instructions

1. Divide the class into four groups and ask them to select a spokesperson for each group.
2. Have Group One make a list of the problems resulting from ineffective communication in videos 1, 2 and 3 above, i.e. create a list for each of these videos.
3. Have the Groups Two, Three, and Four each choose one of the three (3) videos (a different one per group) and have each group determine how the communication in their assigned video could have been improved.
   1. The spokesperson from each group should be prepared to report out the group’s solution to improve the communication.
   2. Encourage the groups to re-enact some or all of the communication if they feel comfortable.
4. As a class, discuss the problems identified by Group 1 and the solutions identified by Groups 2, 3, and 4 for the appropriate videos.

5.6.3. Learning Activity 5 Conducting a Toolbox Meeting

The purpose of this learning activity is to have students practice some of the effective verbal, written, and non-verbal/body language communication skills they have been learning in the module. The activity involves dividing students into groups and having them take turns conducting a toolbox/ tailgate meeting to demonstrate and observe the effectiveness of different types of communication.

Students can use the sample toolbox meeting record forms (Form 3 in the Student module) to do the activity. Copies are included in Appendix F   
for reference.

Instructions

1. Explain the purpose of the activity; reviewing the purpose and importance of toolbox/tailgate meetings with students, e.g., daily meeting to keep safety top of mind.
2. Divide the class into 4 groups and pair each group with another, e.g., Groups 1 and 2 work together, Groups 3 and 4 work together.
3. Ask each group to create a meeting record using the toolbox meeting record form (groups work separately on this task).
   1. For reference, both a completed version of the form and a blank version are provided in the student module.
   2. Students should use their imaginations and what they have learned to date, to complete the form.
4. Working in pairs, have the groups take turns conducting and observing the tailgate meeting e.g., Group 1 conducts the meeting while Group 2 observes, and then Group 2 conducts the meeting while Group 1 observes; Groups 3 and 4 do the same.
   1. The group conducting the meeting selects a foreperson to lead the meeting and uses the tailgate meeting record prepared by the other group as an agenda; the group then completes a new meeting record (using a blank sample form) as part of the meeting.
   2. Observers should take notes about what they see in terms of the communication taking place during the meeting, e.g.,
      1. Is information being communicated effectively?
      2. Is the speaker speaking loud enough? Clearly? Too fast or too slow? Are they using language or words you don’t understand?
      3. Are people listening attentively? How do you know? How are they communicating that they are listening?
      4. What messages are being sent through body language by the speaker? Are they using their hands or facial expressions to add to make what they are saying clearer?
5. After each tailgate meeting is conducted, have the observers provide their feedback, and then the two groups together, discuss how well the process worked.
   1. Did everyone in the meeting understand all of the messages being conveyed? How do you know?
   2. Was the handwriting on the form easy to read? How could it be improved?
   3. Was there enough information given to understand the point or know what to do with it? What kinds of information, if any are missing?
   4. Was all of the information on the form communicated and/or collected and recorded appropriately?
6. Discuss the activity as a class.

6. Suggested Reading

* There is no suggested reading for this module.

7. Notes

Lesson Plan: Module 2.9 – Jobs and Careers

1. Overview

This module provides an introduction to career options and the general culture of the natural gas industry.

2. Learning Outcomes

*When you complete this module, you will be able to:*

1. Describe in detail, the structure and outlook of employment opportunities in the natural gas industry over the next few years.
2. Describe the range of jobs and occupations including their basic characteristics.
3. Identify the jobs and occupations in the natural gas industry that are expected to be in high demand.
4. Find information online about education and training for jobs and occupations in the natural gas industry.

3. Required Materials and Resources

1. Projector with audio.
2. Computers with internet connection; preferably one computer   
   per student.
3. Lesson Plan for WING Student Module 2.9.

4. Icebreaker

Read / Show the quote to the students and ask them to write down what thoughts come to mind when they see/hear it.

“However difficult life may seem, there is always something you can do and succeed at.”

Stephen Hawking, British theoretical physicist

5. Summary of Sections and Learning Activities in the Module

5.1. Industry Outlook

This section provides an overview of economics and cyclical nature of the natural gas industry, as well as its importance to the economy of British Columbia.

5.2. Technology Advancements Changing Workforce and Skills

This section examines some of the impacts that technology is having on the workforce and the changing skillsets required to operate and use these new technologies, as well as the new job and career opportunities these technologies are creating.

5.3. Employment in the Natural Gas Industry

5.3.1. Structure of Employment

Describes the economic benefits natural gas brings to British Columbia through the creation of direct and indirect jobs, as well as the projected demand for employees in the coming years.

5.3.2. Types of Employment

Highlights the fact that the natural gas industry commonly uses contractors for jobs and services that are not considered core. Therefore, a very large portion of the workforce are contractors or self employed.

5.3.3. Range of Jobs

Highlights the array of careers and jobs available within the industry in the upstream, midstream and downstream sectors, as well as business and operations support jobs.

5.3.4. High Demand Jobs and Occupations

5.3.4.1. What Are They?

This section looks at some of the jobs that are considered ‘high demand’ because labour market projections indicate that there are not enough qualified people to fill them. Students will find a listing of some websites and videos that will help them get more detailed information about high demand jobs.

* Website 1: WorkBC [Find High Opportunity Occupations in BC](https://public.tableau.com/profile/bc.labour.market.information.office#!/vizhome/HighOpportunityOccupations_15738582431550/FinalDashboard).
* Video 1: [Careers in Oil & Gas - Youth Series](https://www.youtube.com/watch?v=-BbxPAsdi88) (8 minutes 18 seconds).
* Video 2: [Construction and Maintenance Trades - 4 videos](https://www.stepbc.ca/job-seeker/)   
  (07 minutes, 05 seconds).
* Video 3: [Working with Tervita](http://www.youtube.com/watch?v=tEOa04nbUp4)  (02 minutes 04 seconds).
* Video 4: [Shell Lets You Take Your Career to New Heights](https://www.youtube.com/watch?v=HcXZKJVz23o)   
  (04 minute, 13 seconds).
* Website 2: [Clean Energy Compression](https://www.cleanenergyfuels.com/compression/).
* Website 3: [Westport](http://www.westport.com/).
* Website 4: [Mott Electric GP](http://www.mottelectric.com/).

5.3.4.2. Learning Activity 1 What are my career goals and how can this program help me achieve them?

Learning Activity 1 is based on the information in videos 1, 2, 3, and 4, plus websites 1, 2, 3, and 4, and the preceding materials.

Instructions

1. Have the students watch videos 1, 2, 3, and 4 and review websites 1, 2, 3, and 4.
2. Ask students to complete the following exercise:
3. Identify their goals.
4. Why they are taking the class?
5. What information are they hoping to get out of this course that could put them on the career path they are looking for?
6. Have they found it yet?
7. Have students review the list of possible jobs and careers in the upstream, midstream and downstream sectors.
8. Create a list of any jobs and careers that they are interested in pursuing.
9. Remind them that they need to keep this list handy, as they will use it at the end of the module.
   1. Encourage students to add to this list if they identify additional jobs and career opportunities as they move through the remainder of this module.

5.3.4.3. Where to Find Information About Jobs

This section provides links to additional videos and websites that students should review as part of their job and career search.

* Video 5: [BC Jobs Plan: Liquefied Natural Gas - How Can We Seize the Opportunity?](https://www.youtube.com/watch?v=dXZJYdludps) (01 minute, 30 seconds).
* Video 6: [LNG Workforce](http://www.youtube.com/watch?v=leyMqJEvYR4) (02 minutes, 38 seconds).
* Website 5: [Careers in Oil & Gas](https://careersinoilandgas.com/careers/).
* Website 6: [Coastal GasLink Pipeline Project](https://www.coastalgaslink.com/employment/).
* Website 7: [LNG Canada / JGC Fluor BC LNG Joint Venture](https://www.lngcanada.ca/construction/jgc-fluor-joint-venture/).
* Website 8: [Skilled Trades Employment Program](https://www.stepbc.ca/job-seeker/).
* Website 9: [Aboriginal Job Board](https://aboriginaljobboard.ca/browse-jobs/?search_keywords=LNG&search_location=).
* Website 10: [Indeed.com](https://aboriginaljobboard.ca/browse-jobs/?search_keywords=LNG&search_location=).

5.3.4.4. Learning Activity 2 How do I find information about companies that service the gas industry?

This activity is based on the information contained in videos 5 and 6, and websites 6 through 10, a well as the industry association websites listed in Module 2.3 that students have already reviewed.

Instructions

1. Ask the students to watch videos 6 and 7; review websites 6-10; review the industry association websites in Module 2.3; and then complete the following.
2. Divide the class into groups of two or three.
3. Ask each group to search for companies providing support services to the oil and gas industry using the videos and following the above website links to the appropriate jobs and or careers sections, or sections of the website that allows them to search for companies providing support services to the oil and gas industry.
4. Remind students to also search through the industry association website in Module 2.3 for lists of their member companies.
5. Identify five different service providers and the work that they do. Find out what they do and the types of jobs and careers they offer.
6. Share each groups’ finding with the rest of the class.
7. Remind students to add any interesting jobs to the list they started in Learning Activity 1.

5.3.4.5. Well Paying Jobs

This section highlights the benefits of students properly and carefully research jobs and companies in order to ensure they chose a job/career they will enjoy, as well as one that pays well. A number of websites are listed that can help students better identify rewarding opportunities.

* Website 11: [Professional Engineers and Geoscientists of BC](https://www.apeg.bc.ca/Careers/Compensation-Survey), 2016 Compensation Survey Results.
* Website 12: Canadian [Association](https://www.cagc.ca/) of Geophysical Contractors HR Brochures. Note, students will need to use the “Search” feature to locate the brochures.
* Website 13: [Petroleum Services Association of Canada](https://www.psac.ca/resources/total-compensation-survey/) (PSAC).
* Lists typical jobs in the petroleum service industry and estimated salaries from the PSAC Total Compensation Survey.
* Website 14: [Association of Professional Engineers, Geologists, and Geophysicists of Alberta (APEGGA) Salary Survey](https://www.apega.ca/about-apega/publications/salary-survey/), 2019 Salary Summary.

5.3.5. Specialized or Technical High Demand Jobs

This section highlights how some of the high demand jobs in the natural gas industry require very specialized training or post-secondary education in order to be qualified for them. The following website offers an interactive career quiz.

* Website 15: [Careers in Oil & Gas](https://careersinoilandgas.com/career-explorer/assessment-tool/). Note, there are several other websites that can be found by searching “oil and gas career quiz.”
* Website 16: [Compare Oil and Gas with Other Industries](https://careersinoilandgas.com/career-explorer/industry-transferability/).
* Students can also check the skills and qualifications they have gained in other industries that are transferable to the natural gas industry.

5.3.5.1. Learning Activity 3 Finding information about jobs that require   
specialized training

This learning activity involves students finding information about jobs and occupations that require specialized training or post-secondary education.

Instructions

1. Divide the class into pairs or small groups.
2. Each pair or group will first develop a plan for how to go about finding the right information - what specifically do they need to know?
   1. Consider the questions below and re-visit the questions in Learning Activity 1 to identify other information that would be good to know. Be sure the plan covers all of the information needed to answer the questions in Learning Activity 1.
      1. What experience and skills are required?
      2. What education or training credentials are required?
      3. How long will the training take and where is it offered?
      4. What kind of salary or wages do jobs in that career provide?
      5. What type of employers hire people for jobs in that career, and where are they located?
3. Once the plan is developed, students should choose a career and try out the plan. The career should be different one from any they worked on in either Learning Activities 1 and 2.
4. Once the students have researched the information, ask them to answer the questions in Learning Activity 1, for the career selected by the group.
5. As a group, have them share their plan and findings with the rest of   
   the class.
   1. What made this activity easy or difficult?

5.4. Occupational Education and Training

This section will help students know where to go to find that training or education for jobs in the natural gas industry that require specialized training or post-secondary education.

5.4.1. Post-secondary institutions

List the major accredited, colleges, polytechnics, and universities, and the provincially authorized Private Degree-Granting Institutions offering education and training in British Columbia.

5.4.2. Thinking of a Trade?

5.4.2.1. Why choose a career in the trades?

Provides a brief summary of the advantages and key benefits of a career in   
the trades.

5.4.2.2. What is an apprenticeship?

A brief overview of what an apprenticeship is and the role of the Industry Training Authority.

* Video 7: [Skilled Trades Employment Program - Four STEP Stories Videos (2 minutes each)](https://www.stepbc.ca/job-seeker/).

5.4.3. Learning Activity 4 Finding a training program for a job

1. Ask students to review the list created in Learning Activity 1.
2. Hopefully there are now 2 or 3 or more jobs there that they are   
   interested in.
3. Using the internet and the names of the schools listed above, see if they can find a program that offers training related to one the jobs on their list.
4. Let them know they shouldn’t be discouraged if they cannot find an exact program match. Keep the list and the information created in this activity for Section 3 of the program: Career Awareness.

5.4.4. Financial Support

Provides some basic information on the types of financial assistance, and where students might look to find financial support to pay for their education and training.

* Website 18: [Government of British Columbia](https://www2.gov.bc.ca/gov/content/employment-business/economic-development/funding-and-grants/bc-employer-training-grant).
* Website 19: [Industry Training Authority](https://www.itabc.ca/grants-tax-credits/grants).
* Website 20: [BC Access Grant](https://www.bcbudget.gov.bc.ca/2020/economy.htm).
* Website 21: [Inspire – Indigenous Education Funding](https://indspire.ca/programs/students/bursaries-scholarships/).

6. Suggested Reading

* There is no suggested reading for this module.

7. Notes

Section 3: Career Awareness and Planning

Overview

The purpose of the Career Awareness Section of the WiNG program is to help students develop skills and create tools that will assist them in finding employment in the natural gas industry in the province. It is expected that most students will be seeking entry-level positions, although experience has shown that some students have skills and work experience from other industries and/or countries which may make them more appropriate for higher level positions.

Note, that not all students in the class may be interested in pursuing employment in the natural gas industry (e.g., by taking the course they may have already decided the industry in not for them or they may want to pursue additional training before looking for work). The information and tools in this section of the program have been tailored to the natural gas industry, but the basics of looking for work are the same for all industries.

It is recommended that instructors strongly encourage and engage all students in participating in the learning activities in section 3 regardless of their intentions upon completing the program.

Outputs

The learning activities in the three modules in this section, are geared around having students develop a *personal employment plan* which can be used to launch their search for a job, immediately after completing the WiNG program. In doing this, the goal is that each student leaves the program with a personal employment plan that includes seven key components:

1. A list of one or more target jobs or positions that the student is interested in pursuing for employment.
2. A target list of companies which the student has researched and prioritized as good candidates to work for and likely to have the target job or position.
3. A list of contacts—people in the student’s network who may be able to help with their job search.
4. A resume—tailored to the student’s target job or position and in a format preferred by natural gas employers.
5. A cover letter—in a style preferred by employers in the natural gas industry, and specific to one of the student’s target jobs or positions.
6. A list of references—to confirm the student’s work experience listed on a resume, as well as to provide additional information about the candidate’s past job performance as to whether or not the candidate is the right person for the job.
7. A skills checklist—to help match the student’s skills and knowledge to those listed in a job description or job posting.
8. Interview tips and skills—so students can prepare effectively for interviews resulting from their job search.

Instructions for developing the components of the students’ personal employment plan are included in the lesson plans for each of the modules. Also included are criteria for assessing each component. With respect to assessment, the intention is that the instructor and the student assess each component jointly.

WiNG Certificate of Completion

Successful completion by students of the above noted outputs is one of the requirements for students to receive a WiNG Certificate of Completion. The WiNG Certificate of Completion is recognized provincially by the natural gas industry and the British Columbia Ministry of Advanced Education.

Lesson Plan: Module 3.0 – How to be a Valued Employee

1. Overview

This module provides students with information and insights into the kind of employee that is valued by an employer. Module 3.0 focuses on the key attributes and soft skills that employers look for in a potential new hire and highlights the fact that most major employers rate attitude as being as important to them as a prospective employee’s work skills and technical knowledge.

While the actual skills needed to perform a job can generally be taught, what employers refer to as soft skills can be more difficult to find in a new employee. The discussion and learning activities in this module will help students better understand how they can make themselves an asset to an employer and   
also co-workers.

1. Learning Outcomes

*When you complete this module you will be able to:*

1. Learn about the qualities of a valued employee.
2. Understand what soft skills employers are looking for.
3. Self-assess your own soft skills for your strengths and areas that need more development.
4. Know how to be a valued employee in the natural gas industry or in   
   any workplace.

3. Required Materials and Resources

1. Projector with audio.
2. Computers with internet connection; preferably one computer   
   per student.
3. Lesson Plan for WING Student Module 3.0.

4. Icebreaker

“Tell me and I forget. Teach me and I remember. Involve me and I learn”

*Benjamin Franklin,* Founding Father of the United States

5. Summary of Sections and Learning Activities in the

5.1. Module Qualities of a Valued Employee

This section introduces the concept of soft skills and the importance of having a good attitude as a key determinant in students’ finding the employment they are seeking.

* Video 1: [Hard Skills vs. Soft Skills](https://www.indeed.com/career-advice/resumes-cover-letters/hard-skills-vs-soft-skills) (01 minute, 14 seconds).

5.1.1. Communication Skills

This section outlines the importance of having and developing good communication skills in order to effectively give and receive different kinds of information.

5.1.1.1. Job Interviews

This section focuses on the importance of face-to-face communications, particularly during job interviews. Provides some helpful suggestions for preparing for an interview, including the non-verbal signals a candidate’s attire sends to a prospective employer.

5.1.1.2. Learning Activity 1 Practicing for job interviews

Instructions

1. Split the class up into pairs. One person will be the employer and the other will be the jobseeker.
2. Arrange the space so that you have ‘offices’ set up with a table and two chairs. The person who is acting as the employer will be seated at the table. The jobseeker will enter the ‘office’, introduce themselves and thank the employer for meeting with them.
3. As the jobseeker, you could say something like:

* “Good morning (employer’s name), my name is (job-seeker’s name), it is nice to meet you. Thank you for taking the time to see me. I am very interested in the job you have available.”

1. Ask each employer to offer constructive feedback to their jobseeker   
   (e.g. smile, make eye-contact), let them know what they did well and what needs improvement, then do the entrance again.
2. After the students have practiced this a few times, have them switch roles and redo the exercise.

5.1.2. Teamwork

This section highlights the importance the natural gas industry places on effective teamwork, and the ‘teamwork skills’ that each student needs to be aware of and fully understand, particularly:

|  |  |
| --- | --- |
| * *Communication* | * *Responsibility* |
| * *Honesty* | * *Active listening* |
| * *Empathy* | * *Collaboration* |
| * *Awareness* |  |

5.1.3. Learning Activity 2 Practicing Teamwork

This is a fun teamwork exercise that seems simple but can be quite difficult for some students. It uses almost all of the qualities listed under ‘teamwork skills.’

Instructions

1. If the class is less than 15 or 16 people stay in one group. If the class is larger than that, split them into two groups. Have the group(s) sit or stand in a circle facing each other.
2. Ask them to try to count from 1 to 20 according to the following rules:
   1. Starting at number 1, only one person can speak at a time, saying only one number.
   2. This should be as random as possible i.e. don’t go clockwise or counter-clockwise—mix it up.
   3. Each person must speak at least once. (i.e. if you have a group of 12, every person has to say a number at least once, then others can speak again, but not more than twice).
   4. If two people speak at the same time you need to start over.
   5. If a pattern emerges you need to switch it up – you can’t have the same person say the same number as you try to get up to 20.
   6. Do this as many times as you need to in ten minutes to get to 20 (you might not get there, and that is ok.).
   7. If you happen to get to 20 really easily, turn everyone in the circle so that you are facing out, away from each other and try again.
3. Discuss what is easy or difficult about this exercise and how the words: communication, responsibility, empathy, collaboration, and awareness are necessary to achieve the task.

5.1.4. Time Management Tips

This section introduces the critically important topic of time management. This is an area that instructors should allow ample time for students to:

* Understand what time management is.
* Use simple time management tools that will allow them to work smarter and not harder (be effective, not just busy).
* Understand that time is money and the costs of inefficiency.

Note, when speaking to Time Management Tip #5 (five), instructors should emphasize that this suggestion may not apply when a worker is carrying out a job that has specific procedures and/or tasks that must be carried out in precise sequence.

5.1.5. Learning Activity 3 Time Management

Instructions

1. Ask the students to write down ten (10) things that they did yesterday in no particular order.
2. Beside each, have them write one of the following words:
   1. “Urgent”, meaning it absolutely had to happen or be completed yesterday.
   2. “Less-urgent” meaning it was important but could wait a day   
      or two.
   3. “Not-urgent” meaning it could happen at any time, as long as it happened eventually (i.e. within a week or month).
   4. “Time-waster” meaning it was an activity that was unproductive or had no importance.
3. Next, on a scale of 1-10 with 1, being the most attention, and 10 being the least attention, the students should rate which tasks or activities they spent most of their time on.
4. Once Step 3 has been completed, ask students to re-evaluate what they spent time on yesterday.
   1. Ask, “What if you had the chance to have a “do-over” of yesterday’s activities?”
   2. Tell them, “Knowing that if you were more specific about the details of your schedule, what would you have done differently?”
   3. Have the students create a new ‘plan’ that makes the best use of their time to achieve the same things.
5. Discuss as a class what they saw about how they managed their time.

5.1.6. Flexibility / Adaptability

This section presents the concepts of flexibility and adaptability as critical soft skills that can make a worker more valued by their employer and team members. Provides definitions of what flexibility means and doesn’t mean.

5.1.7. Learning Activity 4 Flexibility

Instructions

1. Ask students to cross their arms, just like they would if they were bored or waiting for someone or something.
2. Have them hold this position for one minute.
3. After a minute, ask them to relax their arms and let them hang loosely at their side.
4. Have them cross their arms again, but this time do it with the opposite arm on top.
5. Ask them to hold this position for one minute then relax their arms again.
6. With the group discuss the following questions:
   1. How did it feel when they crossed their arms the other way?
   2. Did it come naturally, or did they have to stop and think about it?
   3. Were you comfortable doing this differently from their normal process?
   4. What are some things that make people resistant to change?
   5. What could you do to make this new arms-crossed position more comfortable?

5.2. Conclusion

Instructors should provide some final thoughts and comments about the critical importance of looking beyond mechanical or technical skills and understand that employers deem soft skills an integral part of any candidate’s overall skill set.

6. Suggested Reading

* There is no suggested reading for this module.

## 7. Notes

Lesson Plan: Module 3.1 Identifying Interests & Skills

1. Overview

This module provides information about high demand careers in the Natural Gas industry in British Columbia. Students will explore different jobs and learn how to find information useful when searching for employment. Students will now begin building their personal employment plan – specifically, they select a target career/job and complete a career/job summary.

2. Learning Outcomes

*When you complete this module you will be able to:*

1. Identify your interests and talents in terms of occupations and jobs.
2. Find detailed information online about occupations and jobs in the natural gas industry in British Columbia.
3. Understand job competencies including identify ones you have and ones you may need to develop.
4. Match your interests, talents, and job competencies to specific occupations and jobs in the natural gas industry.

3. Required Materials and Resources

1. Projector with audio.
2. Computers with internet connection; preferably one computer   
   per student.
3. Lesson Plan for WING Student Module 3.1.

4. Icebreaker

“We are what we repeatedly do. Excellence, then, is not an act, but a habit”

Aristotle, Greek philosopher

5. Summary of Sections and Learning Activities in the Module

5.1. Your Personal Employment Plan

Introduces students to their Personal Employment Plan and the component of the Plan they have already completed, and those that they will be working on in this Module.

5.1.1. WiNG Certificate of Completion

States that a completed Personal Employment Plan is a core requirement in order to receive a Certificate of Completion.

5.2. Where Do I Start?

Reviews what students have already accomplished so far in this program.

5.2.1. Take Stock

This section allows students to take stock of their interests, talents and basic work preferences.

* Video 1: [Careers in Oil & Gas: Opportunity is Knocking! (5 minutes,   
  52 seconds)](https://www.youtube.com/watch?v=CJ4EosY1064).

5.2.2. Resources to Help Take Stock

* Website 1: [PetroLMI – Careers in Oil and Gas: Career Options](https://careersinoilandgas.com/career-explorer/).
* Website 2: [WorkBC – Career Toolkit](https://www.workbc.ca/Jobs-Careers/Career-Toolkit.aspx).
* Website 3: [PetroLMI – Build Your Career](https://careersinoilandgas.com/careers/).
* Website 4: [On-Line Self-Assessment Tool through the University of Toronto](http://www.utsc.utoronto.ca/webapps/aacc-tools/SelfAssessment/online_inventory/).

5.2.2.1. Learning Activity 1 Select Career Exploration Resources to Help You

In this learning activity, student will explore websites 1, 2 and 3 and select links to pages that they think will be most helpful for them to identify target occupations or jobs to pursue in the natural gas industry.

Instructions

1. Follow the hyperlinks to websites 1, 2 and 3.
2. Refer student to Form 1: *Resources to Help Identify My Target Occupations/Jobs* in the Student Module.
3. Instruct them to make a list of 6 primary resources that will assist them in identifying a target career or job. Allow them a minimum of ten minutes to read the information that they think is useful.
4. Next, ask the students to list 6 additional resources, or links to other websites that they think will be helpful in selecting their target list of occupations, or for other parts of their employment plan.
5. For each resource/website, briefly explain why they think it will   
   be useful.

5.2.2.2. Learning Activity 2: Identify your Interests, Talents, and Work

In this learning activity, students will use an online self-assessment tool to see what is important to them when it comes to a career; after which they will work with a partner as peer career counselors to explore the results.

1. Direct students to the online self-assessment available on Website 4 and complete the assessment.
2. Have them print out their results.
3. Ask students to partner with a classmate, and then, working with that partner, use the five (5) Peer Career Counsellor Activity Questions below and take turns interviewing each other.
4. When the student acts as the interviewer, they should take notes on their partner’s responses.
   1. Remind the ‘interviewer’ to prompt their partner to think about how their talents and interests might fit in to specific jobs.
5. When the other partner is being interviewed, remind the students to use the information in their self-assessment to help answer the questions. Be creative!

5.2.2.2.1. Peer Career Counsellor Activity Questions

1. What do you enjoy doing best?
2. What do you DO best?
3. What do your friends and family think you are good at?
4. What jobs (paid, volunteer, unusual classes) have you had to date? What parts of those jobs did you like best?
   1. Have the students create a list of all the things they liked to do from each job.
5. What are the skills and qualities required by your hobbies, interests, talents, and the jobs that you have had?
   1. Have students create a list using **Form 2: Interests, Talents and Work Environment Preferences** in the student module. Cross out any that don’t apply and add some of their own.
6. What are some of the careers and jobs that you have learned about in this program that you think would be well suited to your skills, talents, and education?
   1. Create a list using **Form 3**, in the student module.

5.2.3. Competencies

5.2.3.1. Why?

This section describes the growing use of competencies by a growing number of companies and industries in Canada, including the natural gas industry, as a basis for hiring, advancement, development, and other human resource decisions. Highlights how major industries and professional bodies use them to support certification, registration, and licensing.

5.2.3.2. Tasks and Competencies

Describes the relationship between tasks and competencies.

Defines competencies as*: observable* skills, knowledge, abilities, motivation, or traits *defined in terms of the behaviours needed for successful job performance*.

Simply put, they are the tasks that describe that what needs to be done; and, how the task or job is done.

5.2.3.3. Benefits of Competencies

Outlines some of the core benefits of using competencies.

The Student module lists some general competencies in ***Table 1*** that natural gas employers generally look for in their employees, and in particular when hiring new employees.

5.2.3.4. How do I Know What Competencies I Have?

Outlines the criteria used to assess whether a person has a particular competency.

5.2.3.4.1. Learning Activity 3 Create a Job Competency Checklist for Your   
Employment Plan

This learning activity will help students identify which general competencies, or parts of competencies, they have, and to provide an example from their past where they have demonstrated it.

Instructions

1. Ask students to read through the general competencies on the preceding pages.
2. Ask the students to then individually fill out ***Form 4: My Competencies Checklist*** by using the criteria in ***Figure 4*** to identify the general competencies that they have.
3. For each competency, ask students to think of an example from their work experience, or some other part of their life experience, that shows how they have applied or used the competency properly.
   1. Ask them to write their example in the space provided as if they were explaining it to an employer.
4. Partner students up with a classmate; have them review each other’s Competency Checklists and provide constructive feedback.
   1. Ask students to listen carefully to how their classmate describes their example; is it understandable? If not, help them clarify it.

Ensure that students place their completed Competency Checklist in a separate folder where they can store all of the pieces of their employment plan as they complete them.

5.2.3.5. Learning Activity 4 Create a Career or Job Summary for your employment plan

This activity will help you identify careers and jobs in the natural gas industry that are interesting to you, and then determine which ones you would like   
to pursue.

Instructions

1. Have the students re-visit Website 1 and review the information there.
2. Have them open the [Choose Your Future in Oil & Gas Interactive Quiz](https://careersinoilandgas.com/career-explorer/assessment-tool/).
3. Complete ***Form 5: My Career and Job Choices.***
4. Students should then select one of the careers or jobs they listed in ***Form 5: My Career and Job Choices***, and complete ***Form 6: Career and Job Summary.***
5. Ask the students to place both completed forms in their employment plan folder.

5.2.3.6. Learning Activity 5 Create a Career/Job Skills and Qualifications Checklist

This activity will help you determine how qualified you are for a specific career or job that you are interested in.

Instructions

1. Select one of the career/jobs you identified in learning activity 4, or   
   re-visit website 1 and select a different one
2. Complete **Form 6** and place in your employment plan folder.

5.2.3.7. Venn Diagrams

A basic primer on what a Venn diagram is, how they used, and how they can be helpful.

5.2.3.7.1. Learning Activity 6 Identify Multiple Careers and Jobs

In this learning activity, you will use a Venn diagram (explained below) and information from the WorkBC website to help you identify skills that are common to more than one job. By doing so, you will be able to see how the skills that you have can lead to multiple career paths.

Instructions

1. Break the class into small groups.
2. Direct students to jobs from the [WorkBC website](https://www.workbc.ca/Jobs-Careers/Find-Jobs.aspx), or from the list they made earlier. Have them select the skills from the “Duties” section for each job. Encourage them to try to include skills that they may already have.
3. Have each group create a Venn diagram to compare the skills required by two or three different jobs.
4. Have them identify how many skills they can find that overlap between the jobs. This will help them identify which skills sets may qualify them for more than one potential career path.

5.3. What Parts of My Employment Plan Did I Complete?

Shows the same checklist noted in the beginning of this module, but with the first three items checked-off.

6. Suggested Reading

* [What Color is Your Parachute?](https://www.parachutebook.com/)

## 7. Notes

Lesson Plan: Module 3.2 Looking for Employment in   
Natural Gas

1. Overview

Introduction

This module provides information about preparing for a career in the natural gas industry. It helps students plot their own personal career path. The module is organized around answering three questions:

1. Where do I start looking for employment?
2. How can I use my connections to help in my search?
3. How do I determine if I am qualified for a job?

2. Learning Outcomes

*When you complete this module you will be able to:*

1. Identify desirable characteristics to look for in employers.
2. Build a list of select employers to target in your job search.
3. Use your network to connect with employers in your target list and others who can help you with your job search.
4. Analyze a job description or posting to determine if you are qualified for the job.

3. Required Materials and Resources

1. Projector with audio.
2. Computers with internet connection; preferably one computer per student.
3. Lesson Plan for WING Student Module 3.2.

4. Icebreaker

Ask students to complete the following activity.

Students and instructor - Complete a [personality test](https://www.16personalities.com/) and discuss the results.

5. Summary of Sections and Learning Activities in the Module

5.1. Your Personal Employment Plan

Shows the student the components of their Personal Employment Plan that they have completed, and the components they will be working on in this Module.

5.2. Looking for Employment

General introduction to identifying and searching for a job.

5.3.1. The Formula

This section highlights the approach and complexities of a job search. Particular emphasis is placed on using networks and informal connections to identify possible opportunities, rather then relying on job advertisements and online postings. Outlines three strategies the students should use when searching   
for jobs.

Introduce students to the ‘Formula.’

Target Jobs + Employers + Look for Opportunities = Employment

5.2.1.1. Strategy 1 Target job vacancies

This section discusses the changing strategies for targeting jobs.

5.2.1.2. Strategy 2 Target select employers

Strategy 2 speaks creating lists of target employers. Refers students to a chart listing the characteristics of excellent employers.

5.2.1.3. Strategy 3 Look for opportunities

Strategy 3 focuses on improving your knowledge about potential employers when looking for and identifying opportunities.

5.2.1.4. Learning Activity 1 Build a Target Employer List for Your   
Employment Plan

In this learning activity, students will build a list of employers to target during their job search. As a start, students can use the list of companies they created in previous modules, e.g., 2.3 Upstream, 2.4 Midstream, 2.5 Downstream, 2.7 Safety, and 2.9 Jobs and Careers.

Instructions

1. Have the students retrieve their list of companies that they made in previous modules as well as the list of career and job choices they have already put in their employment plan.
2. Ask the students to select one of their career or job choices.
3. Have them make a list of the characteristics they want in an employer.
4. Ask the students to identify three to five potential employers for the career/job choice they have selected, by researching their websites and other websites to see if they have the characteristics, they want.
   1. Remind them about the websites shown in modules 2.3 to 2.6 for links to companies and their information.
5. Direct the students to use ***Form 1 Target Employers*** to record information about the employers they have decide to select.
   1. Verify if any of the employers currently have job vacancies or postings on their website and note it on the form.
   2. Place the completed forms in your employment plan.

5.2.2. How to Make Connections

This section provides information and proven, time-tested suggestions on how to connect with prospective employers.

5.2.2.1. Network

Provides practical suggestions on how to build a proper and strong network of people and organizations that can help students identify job opportunities, and simultaneously, let people know they are looking for new opportunities.

Looks at traditional personal networking channels through to the use of websites and major social media platforms.

5.2.2.2. Referrals and Introductions

Outlines how to effectively use referrals or introductions to extend one’s network.

5.2.2.3. Conduct Information Interviews

Outlines the standards steps (the Do’s and Don’ts) for conducting information interviews – to assist students in gathering additional industry information.

5.2.2.4. Follow Up

Outlines the proper etiquette and strategy for staying in touch with people

5.2.2.5. Learning Activity 2 Identify People in your Network for your   
Employment Plan

Instructions

1. Ask the students to create a list of all of the people they know – in other words, their Contacts/Networks.
   1. Explain that the output of this exercise will become a key component of their personal employment plan.
2. Suggest they use the following to help jog their memory, and group the names they identify by:
   1. ***Employment related contacts:*** owners and managers of companies they have worked for (current and previously), owners of other businesses they know or have met, supervisors they reported to, current and previous co-workers.
   2. ***Personal contacts:*** immediate family, relatives, friends, neighbors, school friends, spiritual leaders, Elders, community members.
   3. ***Acquaintances:*** teachers, doctors, lawyers, accountants, coaches, teammates on sports teams, members of social clubs or special interest groups, community leaders.
3. Direct students to use **Form 2 List of Contacts/Network** to create a formal record of names under the three categories.
4. When they have completed their list, pair up students with a classmate and have them compare their respective lists.
   1. Determine if there are categories and/or types of contacts the other person has that might be worth adding to their own respective lists.
   2. Use social and networking sites like LinkedIn and Facebook to identify any additional connections to add to their List of Contacts/Network.
   3. Place the completed form in their employment plan.

5.2.3. The Three Ps to Job Searching

Positive, Patience, and Perseverance

This section highlights the need to remain as positive as humanly possible during a job search. Instructors should emphasize that searching for work takes time (sometimes lots of it), and it can be challenging and stressful.

Remind students that it’s important to stay positive and try to avoid becoming discouraged

Emphasize that fact that depending on the conditions of the job market and the industry, it is not unusual for it to take a few months, even a year, to find a job, and that it is very, very normal to hear more then a few NOs before getting that big YES!

5.2.4. Job Postings, and Ads

This section introduces the students to job postings, and in particular, the need to properly read, analyze and understand what is being asked for in a job advertisement. Not properly addressing the requirements in a posting can significantly diminish, if not completely eliminate a person from getting an interview. Research shows that less than 5 percent of the people who applied for a job get an interview.

5.2.4.1. Important Sources of Information

This section describes what is most often contained in a job posting.

5.2.4.2. Ideal Candidates

This section explains the perspective a posting is usually written from, and how a student should read and interpret the document.

5.2.4.3. Learning Activity 3 Analyze a Job Posting for your Employment Plan

In this learning activity, students will analyze a job posting to determine the degree of the match between what an employer is looking for, and their own skills and qualifications.

Instructions

1. Have the students review the **Resource 3 Shipper/Receiver Job Posting**. Alternatively, they can use select a job posting or job ad that they want to analyze.
2. Have them carefully read through the job posting or job advertisement.
3. Ask them to take a highlighter pen and highlight all of the key words and phrases in the job posting that are related to the following general requirements for the job:
   1. Skills.
   2. Knowledge.
   3. Expertise.
   4. Certifications.
   5. Licenses.
   6. Trade Qualifications.
   7. Experience.
4. Direct the students to complete Form 3 Job Posting Analyzer, following the instructions listed at the top of the form.
5. Once the students have completed Form 3, have them look over their responses and answer the following questions based on the information they entered on the form:
   1. What skills, abilities, or experience does this occupation/job require of an applicant?
   2. What skills, abilities, or experience do I have that would help me to be successful in this job?
   3. What skills, abilities, or experience would I need to acquire to be qualified for this job?

Note, to assist students, Appendix A of the Student Module contains the above noted **Forms**, while Appendix B contains the above noted **Resources**. Remind students they should look for forms in the Appendices.

5.3. What Parts of My Employment Plan Have I Completed?

Shows the same checklist noted in the beginning of this module, but with the first six items checked-off.

6. Suggested Reading

* There is no suggested reading for this module.

7. Notes

Lesson Plan: Module 3.3 Applying for Employment in   
Natural Gas

1. Overview

This is the final module of the Working in Natural Gas Program! This module provides critical information that will help students find employment in the natural gas industry. After completing this module, the student’s Employment Plan will be complete. As the instructor, you will review the plan and conduct a mock interview with each student as the final assessment for the program.

2. Learning Outcomes

*When you complete this module you will be able to:*

1. Accurately complete applications for jobs in the natural gas industry.
2. Customize your cover letter and resume for jobs the natural gas industry.
3. Identify and select references.
4. Demonstrate effective job interviewing skills.
5. Understand the responsibilities of a valuable employee.

3. Required Materials and Resources

1. Projector with audio.
2. Computers with internet connection; preferably one computer   
   per student.
3. Lesson Plan for WiNG Student Module 3.3.

4. Icebreaker

”The most difficult thing is the decision to act, the rest is merely tenacity.”

Amelia Earhart, record-setting aviator

**Reminder**, a vision statement is a “positive, educated prediction” on the part of the instructor about what students may do in their career. This should be a fun and encouraging activity.

5. Summary of Sections and Learning Activities in the Module

5.1. Your Personal Employment Plan

Shows the student the components of their Personal Employment Plan that they have completed, and the components they will be working on in this Module.

5.2. Applying for Employment

This section brings together all of the work the students completed in the previous three modules (3.0, 3.1, and 3.2).

Students will now focus on the actual application process. This section looks at:

* Completing a job application.
* Customizing their resume.
* Preparing a cover letter.
* Putting together references.

5.2.1. Completing Job Applications

This section asks students to review the list of skills and job requirement they previously created and use it to compare to the requirements listed on a job application. There is also a good cautionary article in **Figure 2**, that warns students about some common job scams.

5.2.2. Learning Activity 1 Complete a Job Application

Instructions

1. Direct the students to the two sample job applications in **Appendix A** of the student module.
2. Instruct them to fill out the job application on **Form 1** in Appendix A (Module 3.3) using the Shipper/Receiver job posting from Module 3.2 (**Resource 3**) as the job they are applying for.
   1. Students can also use the results from their analysis of the Shipper/Receiver job posting (Module 3.2, **Form 3**) to help them complete the application.
3. Ask students to go online and find another job posting to practice completing an application form.
   1. Ask them to go online to find another job posting.
4. Ask students to use **Form 2** to fill out an application for the job posting they found online**.**
   1. Note, students should not use the Job Posting Analyzer to help them complete this application form.
5. Once everyone is finished, have the class compare the two applications and discuss as a group.
   1. Is one better than the other? Why or why not?
   2. Does one stand out from the other? Why or why not?

5.2.3. Customizing Your Resume

This section focuses on helping students to understand what a resume is, its purpose, and how to develop their own. A key concept is for students to understand that a resume is like a calling card—something an employer can glance at and say, *“this is someone I need to meet and talk to.”*

It also provides a short description of what a resume *is not*.

5.2.3.1. What do natural gas employers look for?

Outlines what most major natural gas employers generally look for when examining a resume; the applicant’s safety certifications, related skills and work experience, and education and training.

5.2.3.2. Learning Activity 2 Customize a Resume for your Employment Plan

**Form 3** located in **Appendix A** of the student module provides a suggested structure for a resume when applying for entry-level work with natural gas industry employers. Students can use this to modify their existing resume or create a new one. **Resource 1** located in **Appendix B** of the Student module provides a completed sample resume for the students to review.

Instructions

1. Ask students to use the template **Form 3** to modify their own resume or create a new one if necessary.
2. Be sure to have them check spelling and grammar carefully.
3. Pair up the students; then ask them to review and assess each others’ resume, and provide some constructive suggestions for improvement.

5.2.4. Preparing a Cover Letter

5.2.4.1. What is a cover letter?

This section of the module provides information about cover letters, a very critical, but oft forgotten, part of the application documents and process.

5.2.4.2. Employers and Cover Letters

Highlights the findings of some recent research that shows that opinions vary amongst employers and human resource professionals regarding the importance of cover letters – that some ask for them, some don’t, some consider them important, others not so much.

What should be emphasized is that:

* *If an employer asks for a cover letter, provide* one; not doing so will likely cause your application and resume to be discarded because the student **didn’t read and follow instructions.**
* *Employers use cover letters to screen out* applicants; if the cover letter does not address what was asked for, employers may view it as the applicant did not take the time to read and respond to what was requested.
* *Typos and grammatical errors can kill your chances of even getting looked* at; spelling mistakes, grammatical errors, addressing the letter to the wrong person, even having a letter that is too long (more than a page) can cause many employers to simply remove you from the pool of potential candidates.

5.2.4.3. Learning Activity 3 Create a Cover Letter for your Employment Plan

This learning activity will help students create their own cover letter for the job they have identified for your employment plan. Form 6 provides a sample cover letter that can assist the students in creating their own versions.

Instructions

1. Direct students to use **Form 4** to write their own cover letter.
2. Be sure they carefully check spelling and grammar.
3. Pair up the students and have them review each others’ resume and provide some constructive suggestions for improvement Putting.

5.2.5. Putting Together References

This section introduces students to the importance of references as an integral and critical part of the job search process. Outlines what constitutes good references and how to identify them.

5.2.5.1. Tips for asking and confirming

Discusses how to ask for a references permission to be on an applicant’s list.

* Website 1: [Alberta alis](https://alis.alberta.ca/look-for-work/resumes-and-references/).

Direct student to this website, which provides some excellent suggestions and information about identifying and selecting good references.

5.2.5.2. Learning Activity 4 Create a List of References for your Employment Plan

In this learning activity, students will create a list of people who have agreed to provide references for them during their job search.

Let students know that even if they don’t plan to look for work right away, it’s a good exercise to go through because they will have to do it at some point. Plus, it always helps to have the information on hand; so when they do need it, it’ll be more of an updating exercise than starting from the beginning.

Instructions

1. Ask students to identify four to six people who know their *character and abilities*, and who they believe would provide a good and credible reference for them.
2. Their goal is to get at least three to agree – especially work-related references.
3. Have the students use **Form 5** to record the name, contact information, and other information that they know about each person.
4. Once they have an initial list of potential references, students will need to reach out to each of them directly to confirm they are willing to be a positive reference.
5. Remind students to use the **tips** noted in the Student Module when they talk to them.
6. Students should record the details of their conversation with each reference on **Form 5**.

5.3. Interviewing

5.3.1. Preparing

This section provides practical information and suggestions about the interview stage of the job search process. The importance of students being properly prepared for an interview should be continuously emphasized.

5.3.1.1. Dress Appropriately

Outlines the importance of creating a positive first impression by presenting a professional, reliable and trustworthy image when the student meets and speaks with an employer. Provides recommendations on what would be considered appropriate dress when going into an interview in the natural gas industry.

5.3.1.2. Practice, Practice, Practice

Highlights that the average job interview takes only about 40 to 60 minutes, and students need to be fully prepared and ready to answer all of a prospective employers’ questions.

The section highlights that students need to be as prepared as possible, by figuring out what they want to say ahead of time and practicing their responses. The Module provides two Tables. **Table 1** lists some relatively common questions asked during job interviews. **Table 2** highlights questions that can and cannot be asked on job applications or during job interviews.

5.3.2. Interviewing Tips

Provides very practical and time-tested suggestions for before and during an interview.

5.3.3. Learning Activity 5 Practice Interviewing

In this learning activity, students will participate in a mock job interview.

Instructions

1. Ask the students to pair up with another student.
2. Review the Common Interview Questions listed in **Table 1.**
3. Each student is to select 2-3 questions from each section of **Table 1**, as well as a few questions from **Table 2.**
4. Have each pair of students brainstorm on how best to answer each question clearly and concisely.
5. Have them take turns interviewing each other using the questions they each have prepared answers for.
   1. Ask the students to start from the beginning, just like they would in a real interview, by entering the interview area and greeting the interviewer by name.
   2. Remind the students to avoid saying “um”, “ah”, “like”, “you know” as much as possible.
   3. Remind the students to also ask and answer one of the questions that interviewers are not supposed to ask so each can practice how to handle that type of question gracefully.
6. At the end of each interview (just as they should in a real interview) – remind them to stand up, shake the interviewer’s (their partner’s hand) and thank them for taking the time to meet with you.
7. Once each individual mock interview is over, the ‘employer’ should provide the candidate with immediate feedback.
   1. Did they look confident or afraid?
   2. Were they polite?
   3. Did they use appropriate language?
   4. Are they too shy or too aggressive?
   5. Did they provide examples when answering questions?

5.4. Now You Have the Job

5.4.1. Employee Responsibilities

This section discusses the importance of understanding a company’s culture before accepting a job, and, after joining a firm they want to work for. Emphasize to students that firm’s look for people that “fit in” to their culture (work safely, responsible, respectful, dependable, take initiative, listen, teamwork, give credit, stay healthy, self-discipline, meet expectations, etc.).

5.4.2. Employer Responsibilities

This section outlines the basic responsibilities employers must meet under federal and provincial legislation. Provides links to the two most critical pieces of legislation that regulate employers in BC. *Emphasize that these codes are there to protect employees from being harmed or exploited on the job.*

5.5. Conclusion

Your Personal Employment Plan is Complete!

Shows the same checklist noted in the beginning of this module, but with all the items checked-off!

Remind the students to print each of the items completed in their employment plan and put them into a folder, and then bring the folder to you at the time of the mock job interview.

Be sure to congratulate the students on their accomplishment in completing the Working in Natural Gas (WiNG) program.

6. Suggested Reading

* There is no suggested reading for this module.

7. Notes

Appendices

1. [Certificate of Completion.](#Appendix_A)

1. [Your Personal Employment Plan Checklist.](#Appendix_B)

1. [Record of Participant Results.](#Appendix_C)

1. [Practical Activity 1 Modeling Key Concepts.](#Appendix_D)

1. [Resources.](#Appendix_E)

Appendix A



Appendix B

|  |  |
| --- | --- |
| Form A | Your Personal Employment Plan  CHECKLIST |
| Student Name |  |
|  | [Last Name, First Name, Middle Name] |
| Job Analysis Tools | * Competency Checklist   *A checklist that shows how your skills, knowledge, and qualifications match to a specific career or job.*   * My Career and Job Choices   *A shortlist of careers or jobs that you are interested in.*   * Career and Job Summary   *Information about one career or job you want to pursue.*   * Job Posting Analyzer   *A tool to take important information from job postings and create job applications, cover letters and resumes that stand out.* |
| Personalized Resources | * List of Target Employers   *A list of target employers you have researched and prioritized as good candidates to work for and likely to have one or more of your target careers or jobs.*   * List of Contacts/Network   *Names and contact information for people in your network to contact to help you with your career or job search.*   * Resume   *A resume in a format preferred by natural gas employers that you have tailored to the career or job you are looking for.*   * Cover Letter   *A cover letter for your target career or job, in a style preferred by employers in the natural gas industry, ready to send to potential employers.*   * References   *A list of carefully chosen personal and business or work contacts who are willing to provide you with a reference for prospective employers.* |

Appendix C

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Record of Participant Results Form | | | | |
| Student Name |  | | | |
| Safety Certificates Obtained | * Common Safety Orientation (Petroleum Safety Training) * Confined Space Pre-Entry & Rescue Awareness * Confined Space Pre-Entry & Rescue Awareness * Detection & Control of Flammable Substances * Fall Protection * Occupational First Aid Level 1 * Occupational First Aid Level 1 - Transportation Endorsement * Ground Disturbance * Hydrogen Sulphide (H2S Alive) * Oilfield Driver Awareness * Transportation of Dangerous Goods * Workplace Hazardous Materials Information System * Wildlife Awareness | | | |
| Program Learning | * Acceptable | | * Not acceptable | |
| Employment Plan | * Complete | | * Not Complete | |
| Participant Outcomes | * Participant is knowledgeable and informed about the natural gas industry * Participant is interested in pursuing employment in the natural gas industry * Participant is interested in pursuing training for an occupation in the natural gas industry | | | |
| Participant Evaluation Survey | * Completed and attached | | * Not completed | |
| Instructor Recommendation | * Participant meets WiNG program completion requirements * Participant does not meet WiNG program completion requirements | | | |
| Comments |  | | | |
| Instructor Attestation | The above noted results are approved and submitted by: | | | |
| Instructor Name [Print] | | Instructor Signature | | Date |

Appendix D

Practical Activity 1 Modeling Key Concepts in the Upstream, Midstream, and Downstream Natural Gas Industry

This activity involves having the students build a model that demonstrates they understand key concepts in the upstream, midstream, and downstream sectors of the natural gas industry. These include, but are not limited to, concepts like:

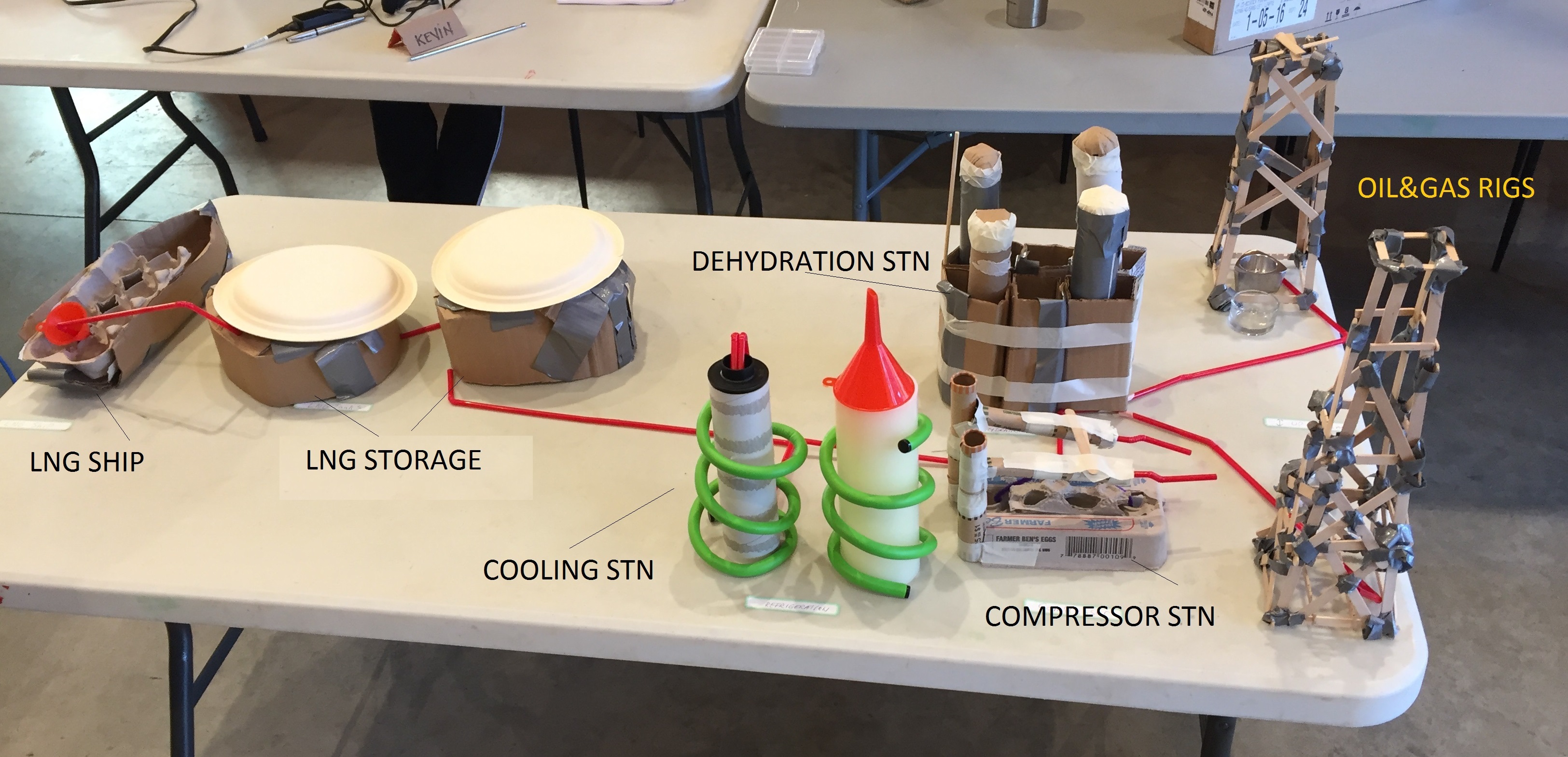
* + Oil & Gas Rigs (scaffolding).
  + Directional drilling, mud circulation, fishing.
  + Pipelines.
  + Storage.
  + Processing & Distribution.
  + LNG.
  + Shipping.

Instructions

1. Instructor Preparation: **Prior to beginning, starting the practical activity**, the instructor will need to source of all the materials required, so that there are sufficient quantities for the number of groups you expect to create in Step 2 below.
2. Create groups of 3-4 students.
3. Ask them to choose a Team Leader in order to present the project for   
   the group.
4. Remind students that they should use all the knowledge gained so far, including reviewing previous videos to make the model.
5. Explain that the Team Leader will be responsible for distributing the tasks in the team.
6. Provide each team with the materials needed to build the model, and show them the example (below) of a model built by one group of WiNG students.
7. Let students know they can use other materials that may be at hand (albeit, no dangerous or flammable materials or toxic substances).

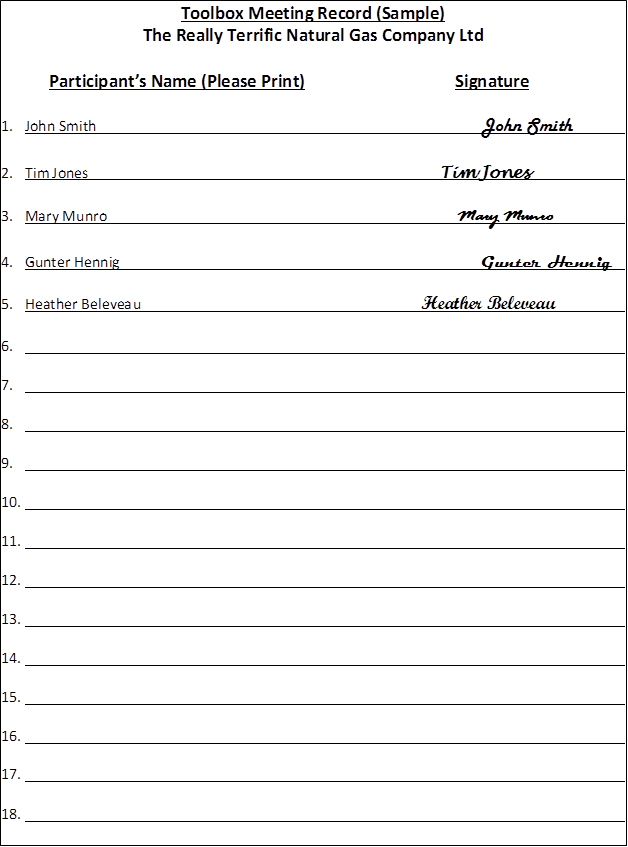
List of suggested Materials Required to Build Model

* Straws for drilling pipes.
* Popsicle sticks for scaffolding.
* Wood glue.
* Helical plastic profile (to mimic the motor).
* Transparent plastic tube for casing.
* Hand sanitizer for mud.
* Masking tape.
* Duct tape.
* Pins or paper clips for fishing hooks.
* Cardboard.
* Paper plates.
* Paper towel tube.

Example Model Built by WiNG Students

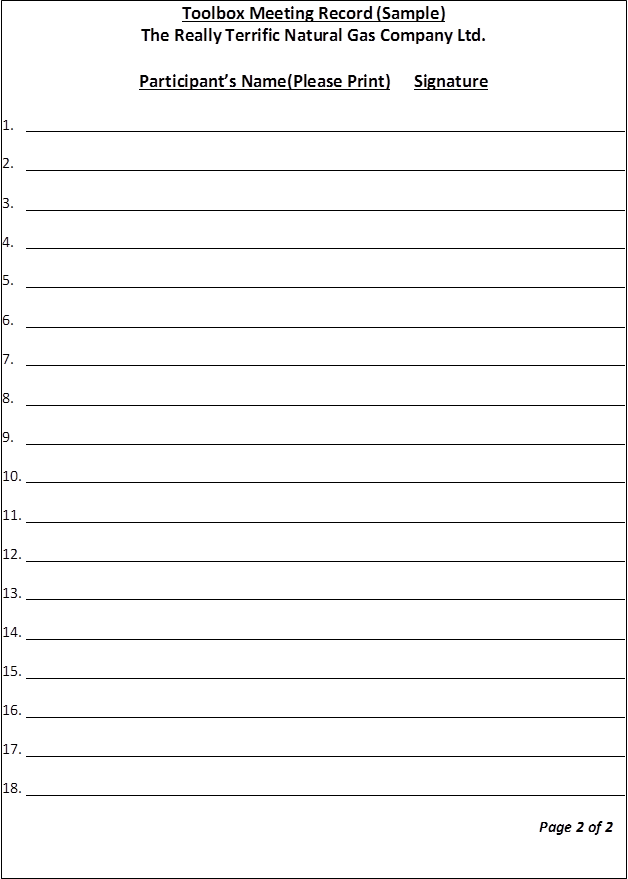
Additional Resources

* Links to videos showing Oil & Gas Rig, directional drilling, and mud circulation models made by WiNG students.
* Video 1: [Hands on projects for demonstrating conventional drilling, directional drilling, mud circulation and fishing](https://www.youtube.com/watch?v=9FeBo-Goplc&feature=youtu.be) (2 minutes, 15 seconds).
* Video 2: [Hands on projects for demonstrating conventional drilling, directional drilling, mud circulation and fishing](https://www.youtube.com/watch?v=KbcOWn6tuOU&feature=youtu.be) (4 minutes, 21 seconds).
* Video 3: [Hands on projects for demonstrating conventional drilling, directional drilling, mud circulation and fishing](https://www.youtube.com/watch?v=Wt3WPuDkIFI&feature=youtu.be) (1 minutes, 10 seconds).

Appendix E

Appendix E

Appendix E

Appendix E

1. This Learning Activity is based on recommendations on Indigenizing curriculum in the resource “Pulling Together: A Guide for Curriculum Developers, a Guide for Indigenization of Post-Secondary Institutions A Professional Learning Series.” Prepared by Asma-Na-Hi Antoine, Rachel Mason, Roberta Mason, Sophia Palahicky, and Carmen Rodriguez de France for BC Campus. [↑](#footnote-ref-2)
2. WorkSafeBC, Refusing Unsafe Work, Retrieved from <https://www.worksafebc.com/en/health-safety/create-manage/rights-responsibilities/refusing-unsafe-work>. [↑](#footnote-ref-3)